In The United States Patent and Trademark Office

Patent App No. 09/939,865
Filed: August 27, 2001
Applicant: Reuben Hertz
Examiner/GAU: Unknown / 3723

ET 472303996 US

Mailed on: 2001, September 17

Petition To Make Special under 37 C.F.R. 1.102 (Infringement)

Assistant Commissioner of Patents and Trademarks
United Stated Department of Commerce
Patent and Trademark Office
Washington, DC, 20231

SIR:

The following is a request for the Commissioner of Patents to Make the aforementioned application Special under 37 C.F.R. 1.102 (Infringement Para 708.02 Section II).

The submitter of this petition will state herein reasons that the petitioner feels is of sufficient basis for the Commissioner to grant the request made herein, identifying infringing material, as well as providing sufficient evidence that the infringing party was aware of the pending application and willfully continued pursing the manufacture and distribution of the infringing apparatus.

Paragraph 708.02, subsection II states "an application may be made special because of actual infringement (but not for prospective infringement) upon payment of the fee and filing of a petition accompanied by a statement by the applicant....."

The following must be provided the following information to meet the requirements of the Petition to Make Special:

A) There is an infringing device or product actually on the market.

SMLX Technologies, Inc., (previously Simplex Medical Systems, Inc.) is currently and has been marketing a product referred to as the "Airbrator" ™. Petitioner will provide supporting documents of the sale of the product herein.

B) A rigid comparison of the alleged product with the claims of the application has been made, and that, in his or her opinion, some of the claims are unquestionably being infringed.

A rigid comparison is identified as such and be provided herein. Further, Exhibit A provides written documentation from the Attorney representing the alleged infringing

party stating that the apparatus nominally appears to be infringing on a claim of the Petitioner's parent application, but questioning the validity of the subject claim.

C) The Petitioner is required to make a careful and thorough search of the prior art or has good knowledge of the prior art.

The Petitioner is a dentist and has good knowledge of the prior art and is in process of filing the proper IDS forms and copies of cited prior art for all known relevant prior art with the subject application. Copies of the IDS forms are enclosed herein.

The Petitioner earnestly requests the Commissioner grant the Petition to Make Special based upon the following documents and evidence:

Infringing Device is Being Marketed

The following is a modified view of FIG 6 of the subject application (identifying elements that are shown in other figures) included for reference to illustrate the details pertinent to the alleged infringement:

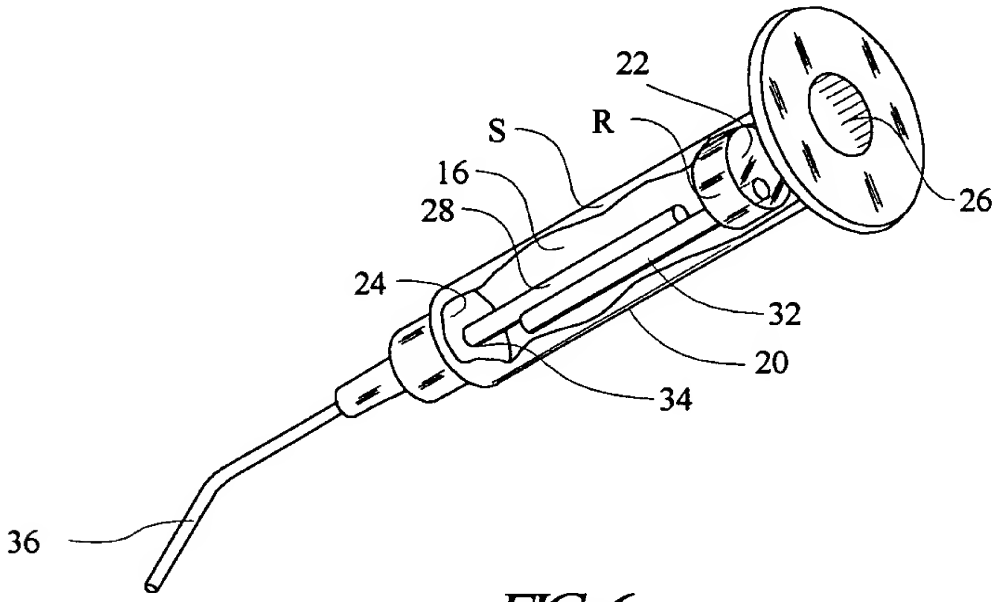
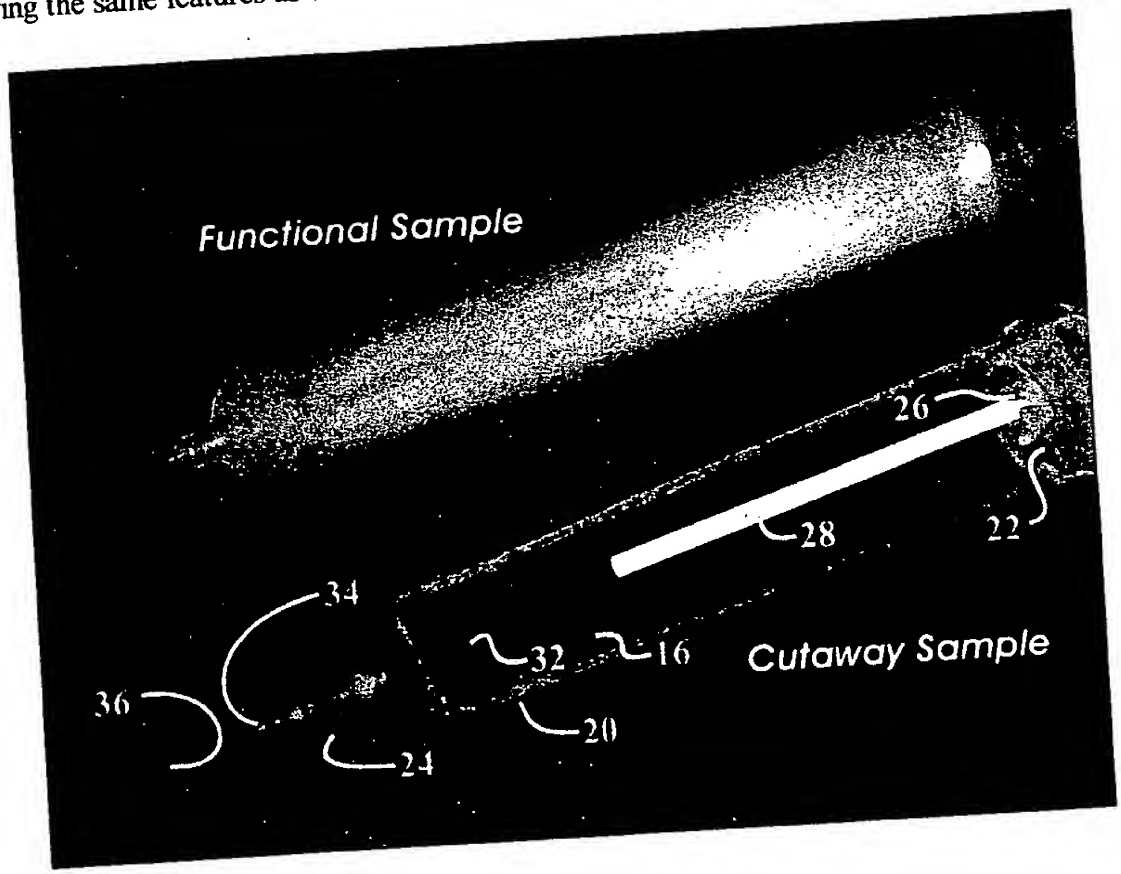


FIG. 6

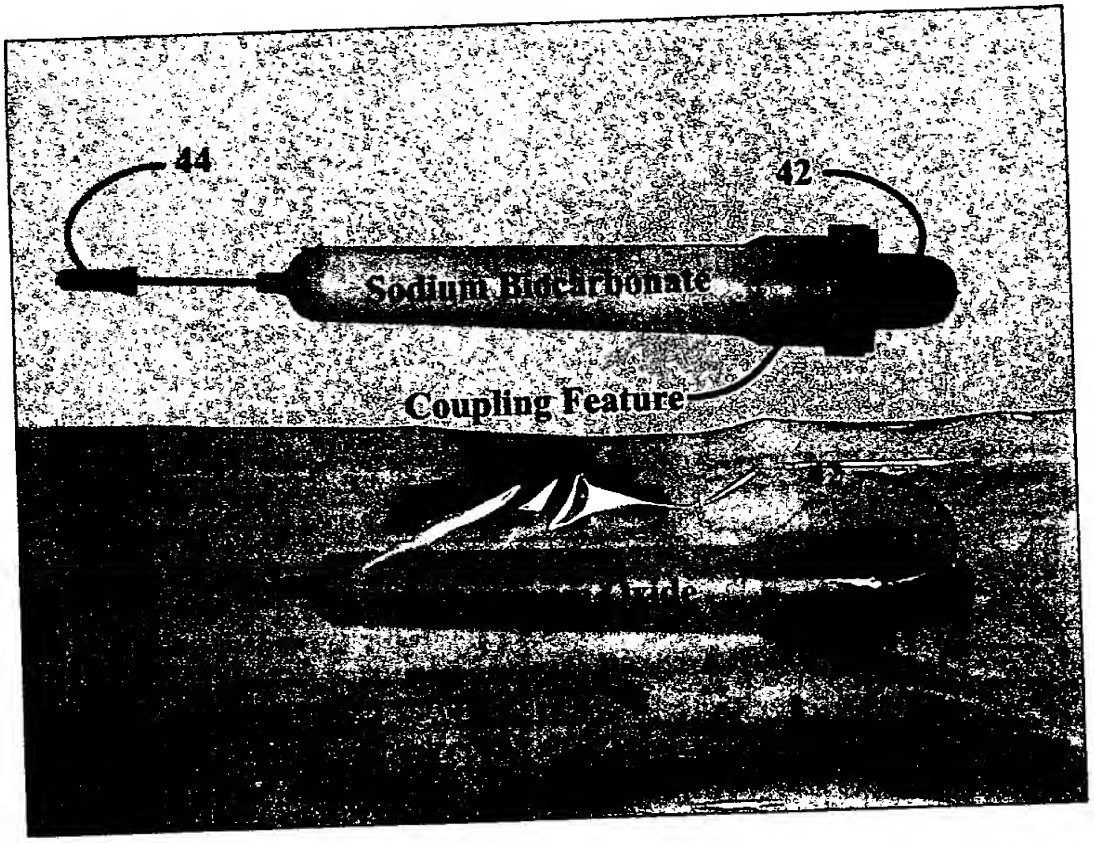
16 – Mixing Chamber
20 – Chamber Wall
22 – First End Wall
24 – Second End Wall
26 – Gas Receiving Port
28 – Discharge Conduit
32 – Gas Delivery Conduit
34 – Mixture Discharge Port
36 – Particle Directing Tube
42 – Inlet Cap (not shown)
44 – Lip Cap (not shown)
S – Syringe

§

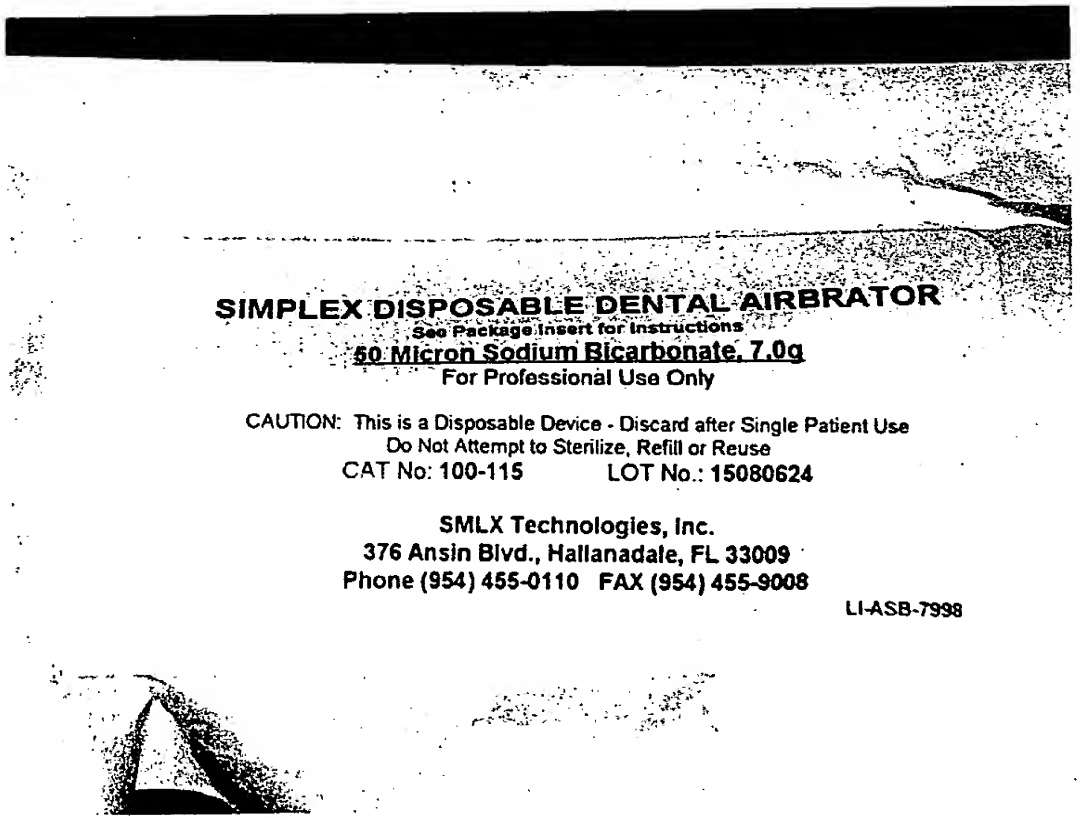
The following is a photograph of the alleged infringing apparatus (SMLX Airbrator™), identifying the same features as described above.



The following is a photograph of two complete handheld particulate matter examples of the alleged infringing devices (SMLX Airbrator™). The photo further illustrates the two end caps 42 and 44, the particulate matter, and the use of color to identify the specific material inside.



The following is a photograph of the label applied to the packaging of the alleged infringing apparatus (SMLX Airbrator™)to identify the alleged infringing party as SMLX Technologies, Inc., where SMLX Technologies, Inc. (previously Simplex Medical Systems, Inc.) was taught the present invention by the Petitioner under a Confidentiality Agreement (Exhibit D).



Rigid Comparison of Alleged Infringing Apparatus with Claims

1. Handheld apparatus for propelling particulate matter, the apparatus comprising:

a mixing chamber **(Item 16 shown in the photo)** having a sidewall **(Item 20 shown in the photo),** a gas receiving port **(Item 26 shown in the photo)** at a first end of the chamber **(Item 24 shown in the photo)** and a discharge end wall **(Item 24 shown in the photo)** at an opposite end of the chamber;

a means for a gas delivery conduit **(Item 28 shown in the photo),** whereby the gas delivery conduit would be disposed within the chamber and extend into the mixing chamber;

a discharge port **(Item 34 shown in the photo)** in the discharge end wall **(Item 24 shown in the photo);**

a discharge conduit **(Item 32 shown in the photo)** disposed within the chamber and extending in fluid communication from the discharge port towards the gas receiving port;

a means for an elongated particle-directing tube **(Item 36 shown in the photo)** disposed external to the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;

wherein the mixing chamber is of a designed size and shape well suited of being held within a user's hand **(The chamber portion of the alleged infringing apparatus unit is 4.25" in length – See Exhibits M and N herein).**

2. The apparatus of Claim 1, wherein the size and shape of the mixing chamber resembles that of a syringe **(See Photo on Pages 3 and 4).**

3. The apparatus of Claim 1, wherein the apparatus further comprises an elongated particle directing tube **(Item 36 shown in the photo),** the elongated particle-directing tube being in fluid communication with the discharge conduit.

4. The apparatus of Claim 3, wherein the elongated particle directing tube is a continuation of the discharge conduit **(Items 32 and 36 shown in the photo are the same metal tube).**

5. The apparatus of Claim 3, wherein the elongated particle directing tube is at least one of capable of being bent and pre-bent. **(The metal discharge conduit is 0.050" in diameter and is easily bent. Also, see Exhibit M, whereby BioStar sells tooling to bend the elongated particle directing tube.)**

6. The apparatus of Claim 1, wherein the apparatus further comprises a color-coding to identify the particulate matter. **(The alleged apparatus further comprises of two end caps that are color coded to identify particulate matter. Red designates Aluminum Oxide. Blue designates Sodium Bicarbonate. Also, see Exhibits M and N which identify three color codes for various levels of performance.)**

7. The apparatus of Claim 1, the apparatus further comprising at least one of a gas delivery port cap and a discharge end cap. **(Items 42 and 44 shown in the photo.)**

8. The apparatus of Claim 7, wherein the apparatus further comprising a color-coding to identify the particulate matter. **(The alleged apparatus further comprises of two end caps that are color coded to identify particulate matter. Red designates Aluminum Oxide. Blue designates Sodium Bicarbonate. Also, see Exhibits M and N which identify three color codes for various levels of performance.).**

9. The apparatus of Claim 2, the apparatus further comprising an attachment area located proximate the gas receiving port to the apparatus **(See identified area within the photos)**, whereby the attachment area provides a means to couple the apparatus to an air supply source.

10. Handheld apparatus for propelling particulate matter, the apparatus comprising:

a mixing chamber **(Item 16 shown in the photo)** having a sidewall**(Item 20 shown in the photo)**, a gas receiving port **(Item 26 shown in the photo)** at a first end **(Item 22 shown in the**

photo)of the chamber and a discharge end wall **(Item 24 shown in the photo)** at an opposite end of the chamber;

a gas delivery conduit, whereby the gas delivery conduit **(Item 28 shown in the photo)** is disposed within the chamber and extends into the mixing chamber;

a discharge port **(Item 34 shown in the photo)** in the discharge end wall **(Item 24 shown in the photo)**;

a discharge conduit **(Item 32 shown in the photo)** disposed within the chamber and extending in fluid communication from the discharge port towards the gas receiving port;

a means for an elongated particle-directing tube **(Item 36 shown in the photo)** disposed external to the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;

wherein the mixing chamber is of a designed size and shape well suited of being held within a user's hand. **(The chamber portion of the alleged infringing apparatus unit is 4.25" in length – See Exhibits M and N herein.)**

11. The apparatus of Claim 10, whereby the gas delivery conduit [if] is positioned off-center with respects to the gas delivery port. **(The gas delivery port of the alleged infringing apparatus is off center with respect to the center of the chamber.)**

12. The apparatus of Claim 10, wherein the size and shape of the mixing chamber resembles that of a syringe **(See photos provided)**.

13. The apparatus of Claim 10, wherein the apparatus further comprises an elongated particle directing tube **(Item 36 shown in the photo)**, the elongated particle-directing tube being in fluid communication with the discharge conduit.

14. The apparatus of Claim 13, wherein the elongated particle directing tube is a continuation of the discharge conduit. **(Items 32 and 36 shown in the photo are the same metal tube)**

15. The apparatus of Claim 13, wherein the elongated particle directing tube is at least one of capable of being bent and pre-bent. **(The metal discharge conduit is 0.050" in diameter and is easily bent. Also, see Exhibit M, whereby BioStar sells tooling to bend the elongated particle directing tube.)**

16. The apparatus of Claim 10, wherein the apparatus further comprises a color-coding to identify the particulate matter. **(The alleged apparatus further comprises of two end caps that are color coded to identify particulate matter. Red designates Aluminum Oxide. Blue designates Sodium Bicarbonate. Also, see Exhibits M and N which identify three color codes for various levels of performance.)**

17. The apparatus of Claim 10, the apparatus further comprising at least one of a gas delivery port cap and a discharge end cap. **(Items 42 and 44 shown in the photo.)**

18. The apparatus of Claim 17, wherein the apparatus further comprising a color-coding to identify the particulate matter. **(The alleged apparatus further comprises of two end caps that are color coded to identify particulate matter. Red designates Aluminum Oxide. Blue designates Sodium Bicarbonate. Also, see Exhibits M and N which identify three color codes for various levels of performance.)**

19. The apparatus of Claim 12, the apparatus further comprising an attachment area located proximate the gas receiving port to the apparatus **(See identified area within the photos)**, whereby the attachment area provides a means to couple the apparatus to an air supply source.

Claims 20-28 are not applicable.

29. Handheld apparatus for propelling particulate matter, the apparatus comprising:

a mixing chamber **(Item 16 shown in the photo)** having a sidewall **(Item 20 shown in the photo),** a gas receiving port **(Item 26 shown in the photo)** at a first end of the chamber **(Item 24 shown in the photo)** and a discharge end wall **(Item 24 shown in the photo)** at an opposite end of the chamber;

a gas delivery conduit **(Item 28 shown in the photo),** whereby the gas delivery conduit is disposed within the chamber and extends into the mixing chamber;

a discharge port **(Item 34 shown in the photo)** in the discharge end wall **(Item 24 shown in the photo);**

a discharge conduit **(Item 32 shown in the photo)** disposed within the chamber and extending in fluid communication from the discharge port towards the gas receiving port;

a means for an elongated particle-directing tube **(Item 36 shown in the photo)** disposed external to the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;

particulate matter **(See photo);**

a means to temporarily containing particulate matter within the mixing chamber **(Items 42 and 44 shown in the photo);**

wherein the mixing chamber is of a designed size and shape well suited of being held within a user's hand. **(The chamber portion of the alleged infringing apparatus unit is 4.25" in length. – See Exhibits M and N herein.)**

30. The apparatus of Claim 29, whereby the gas delivery conduit [if] is positioned off-center with respects to the gas delivery port. **(The gas delivery conduit is off center with respect to the center of the chamber.)**

31. The apparatus of Claim 29, wherein the size and shape of the mixing chamber resembles that of a syringe. **(See photo)**

32. The apparatus of Claim 29, wherein the apparatus further comprises an elongated particle directing tube **(Item 36 shown in photo)**, the elongated particle-directing tube being in fluid communication with the discharge conduit **(Item 32 shown in photo)**. **(The elongated particle directing tube and the discharge conduit are the same metal tube.)**

33. The apparatus of Claim 32, wherein the elongated particle directing tube is a continuation of the discharge conduit. **(The elongated particle directing tube and the discharge conduit are the same metal tube.)**

34. The apparatus of Claim 32, wherein the elongated particle directing tube is at least one of capable of being bent and pre-bent. **(The metal discharge conduit is 0.050" in diameter and is easily bent. Also, see Exhibit M, whereby BioStar sells tooling to bend the elongated particle directing tube.)**

35. The apparatus of Claim 29, wherein the apparatus further comprises a color-coding to identify the particulate matter. **(The alleged apparatus further comprises of two end caps that are color coded to identify particulate matter. Red designates Aluminum Oxide. Blue designates Sodium Bicarbonate. Also, see Exhibits M and N which identify three color codes for various levels of performance.)**

36. The apparatus of Claim 29, wherein the means for temporarily containing the particulate matter is of at least one of a gas delivery port cap and a discharge end cap. **(Items 42 and 44 shown in photo.)**

37. The apparatus of Claim 36, wherein the apparatus further comprising a color-coding to identify the particulate matter. **(The alleged apparatus further comprises of two end caps that are color coded to identify particulate matter. Red designates Aluminum Oxide. Blue**

designates Sodium Bicarbonate. Also, see Exhibits M and N which identify three color codes for various levels of performance.)

38. The apparatus of Claim 31, the apparatus further comprising an attachment area located proximate the gas receiving port to the apparatus, whereby the attachment area provides a means to couple the apparatus to an air supply source. **(See Photo)**

Additional Background Information that SMLX Technologies, Inc. is Willfully Infringing

Exhibit A

Exhibit A is a response from Attorney Van Der Wall, representing SMLX Technologies, Inc. stating "Claim 10 nominally appears to be infringed by our client's accused product, but you cannot infringe an invalid claim". (third paragraph) "Claim 10 is clearly anticipated by Schachter, USPN 3,626,841."

Exhibit B

Exhibit B is Hertz US Patent 5,839,946, issued Nov. 24, 1998 and parent to this application is attached herein to present Claim 10 to the Commissioner. Claim 10 states:

10. Handheld apparatus for propelling particulate matter against a surface of a patient's tooth, comprising:

a chamber having a sidewall, a first end wall at a one end of the chamber and a second end wall at an opposite end of the chamber;

a gas-receiving port in the first end wall;

a gas-delivery conduit disposed within the chamber and extending in fluid communication from the gas-receiving port towards the second end wall;

a discharge port in the second end wall;

a discharge conduit disposed within the chamber and extending in fluid communication from the discharge port towards the first end wall;

an elongate particle-directing tube disposed external the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;

wherein:

at least one of the first end wall and the second end wall abuts and is contiguous with the sidewall of the chamber.

Exhibit C

Exhibit C is a copy of Schachter, USPN 3,626,841, issued December 14, 1971 which is also included in an Information Disclosure Statement in Conjunction with the above aforementioned application. Schachter teaches a large, non-handheld and non-disposable unit illustrated in Figure 1 which attaches to a non-disposable, handheld delivery device illustrated in Figure 2. The claim made by Attorney Van DerWall stating "it appears that claims of the '946 patent are invalid in light of prior art. See e.g. Schachter, USPN 3,626,841." The Applicants application teaches a completely handheld, disposable, prefilled, color-coded apparatus (that can resemble a syringe) that is cost effective to manufacture and use. Schachter '841 does not teach said limitations.

Exhibit D

Exhibit D is Schur / Groman / Hertz (Petitioner) Confidentiality Agreement dated August 25, 1995 attached herein to identify that an Officer within the infringing party (SMLX Technologies, Inc., previously Simplex Medical Systems, Inc. and Analyte Diagnostics, Inc.) was under a Confidentiality Agreement and continues to remain under the Confidentiality Agreement. Mr. Schur breached the Confidentiality Agreement by disclosing the invention to the USPTO on November 15, 1996 as US Patent Application No. 08/746,737 without the permission of the applicant of the subject application; and again with US Patent Application No. 08/863,857, Filed on May 27, 1997, which later issued as US Patent 6,004,191 on December 21, 1999. Schur, et al. '191 was assigned to Simplex Medical Systems, Inc. which loater became SMLX Technologies, Inc., further breaching the Confidentiality Agreement.

Exhibit E

Exhibit E is a copy of Schur, et al. US Patent 6,004,191 issued on December 21, 1999 as a reference to remarks stated in conjunction with the Confidentiality Agreement (Exhibit D). Schur et al. '191 claims priority to US Patent Application No. 08/746,737 filed on November 15, 1996, including the Petitioner as an inventor without knowledge or permission of the Petitioner. Petitioner will present documentation whereby Schur, et al. had numerous opportunities to inform and request a signature from the Petitioner. The Petitioner would like to direct the Commissioner to Figures 1 and 2 within Schur, et al. '191.

Exhibit F

Exhibit F is a Submission of New Application with Missing Parts. Schur, et al. (Alleged Infringing party) filed a submission for a new Utility Patent Application (Application 08/746,737, filed on

November 15, 1996) with missing parts. Schur, et al. filed the CIP stating, "The completed declaration and verified statement of Reuben Hertz (Petitioner) will be furnished later."

US Application Number 08/746,737 was filed with the Petitioner's name as an inventor to provide continuity of inventorship between the CIP and the Petitioner's parent patent application (Application number 08/517,379, filed August 21, 1995, granted as US Patent No. 5,839,946 on November 24, 1998) without the knowledge of the Petitioner. Under 37 CFR 1.63(a)(3), Applicants are required to identify each inventor. Schur, et al. did file naming all inventors. Under 35 U.S.C. 116 and 37 CFR 1.47(a) Applicants are required to use due diligence to find all inventors and make due diligence to have all inventors join the application and sign said oath or declaration. Petitioner believes that since Schur, et al. (Alleged Infringing Party) were in continuous contact with the Petitioner during the time of the filing of the CIP application, and the Schur, et al. (Alleged Infringing Party) did not present or attempt to present that they were filing the CIP application to the Petitioner.

Exhibit G

Exhibit G is a USPTO Notice to File Missing Parts of Application for Schur et al. Appl. 08/746,737 (See Exhibit F herein) on December 26, 1996. The Petitioner (Inventor 1 of the CIP application) was not made aware of any such request, nor informed that the CIP application was filed at the time of filing.

Exhibit H

Exhibit H is a correspondence dated November 5, 1996 from Hertz (Petitioner) to Oltman (Representative of Alleged Infringing Party until December 6, 1996). The Petitioner maintains that the Petitioner was in contact with the Applicants and provides sufficient documentation herein. The correspondence dated November 5, 1996 included a request for information pertaining to any additional pending applications by the Alleged Infringing Party.

Exhibit I

Exhibit I is a correspondence dated December 6, 1996 from Oltman (Representative of alleged infringing party until December 6, 1996) to Schur, et al. (Alleged Infringing Party). Attorney Oltman (Representing the Alleged Infringing Party) informed the Applicants (Alleged Infringing Party) of the pending CIP upon the written request of the Petitioner that Attorney Oltman withdraws from representation. Included with this statement, the Petitioner would like to present to the Commissioner in good faith, that in the correspondence dated December 6, 1996 Attorney Oltman DID regretfully withdraw representation of the alleged infringing party. The Protester believes that when the Attorney understood the potential mis-representation by the Alleged Infringing Party, the Attorney immediately withdrew in accordance with proper conduct and ethics.

Exhibit J

Exhibit J is a correspondence dated December 10, 1996 from Attorney Oltman to Hertz alluding to the rights of Hertz if Schur and Trafton (Alleged Infrining Party) were to use the Petitioner's invention.

Exhibit K

Exhibit K is a correspondence dated December 19, 1996 from Attorney Goldenberg to Trafton / Simplex Medical Systems, Inc. stating that any intentions for joint ventures have ceased and that all parties will continue to adhere to the terms and conditions of the Confidentiality Agreement (Exhibit D herein). The Petitioner believes that the documentation herein, not only has demonstrated the alleged infringement, but willful intention for infringement.

The Petitioner provides supporting evidence within the correspondence dated December 19, 1996 which substantiates conflicts pertaining to potential licensing rights between the Petitioner and Alleged Infringing Party as the invention was described in USPN 5839946. The Alleged Infringing Party filed the second CIP Application Number 08/863,857 on May 27, 1997, which was granted as USPN 6,004,191 on December 21, 1999 after the dissolution of any agreements between the Petitioner (Inventor of the Handheld Apparatus for Propelling Particulate Matter).

Exhibit L

Exhibit L is a copy of a sales brochure from SMLX Technologies. The brochure states on Page 1, Paragraph 1 that SMLX was formerly known as Simplex Medical Systems. The brochure further states on Page 2, Paragraph 1 that "A dentist and friend of an SMLX scientist told him that, while airabrasion is a great technology for the dental industry, the existing abrasion machines cost thousands of dollars, are bulky, have to be cleaned and sterilized after every use and require regular maintenance. He asked our scientist if he invent a less expensive product that would be easier to use."

Paragraph 2 states "In less than a year, SMLX personnel invented a disposable dental air abrasion unit that could be attached to normal dental equipment found in every dentist's office and would retail for less than $10."

The Petitioner believes that he has provided proof that the Petitioner had invented the concept (filed a US Application on August 21, 1995 – Exhibit B), THEN showed individuals within Simplex Medical Systems (Henry Schur) on August 22, 1995 under a Confidentiality Agreement (Exhibit D).

Exhibit M

Exhibit M is a copy of a sales brochure from Biostar stating that the product is manufactured by SMLX Technologies. Exhibit M also states that the tip is bendable and that they offer a "Tip Bending Tool". This corresponds with Claims 5, 15, and 34. The brochure further provides that the "Airbrators" are sold as shown in the photographs without a connector. The brochure further

illustrates the color coding – Orange / Red Rapid penetration; Blue – Medium Performance; Green – Light Performance.

Exhibit N

Exhibit N is a copy of a sales brochure from NonInvasiveMeds.com, Inc. includes information similar to the Biostar brochure.

Exhibit O

Exhibit O is a copy of a sales receipt from NonInvasiveMeds.com, Inc. dated January 20, 2001, whereby the Petitioner purchased the samples of the alleged infringing apparatus.

Exhibit P

Exhibit P is a copy of a Simplex Medical Systems, Inc. Shareholder's Meeting Agenda dated September 25, 1996, identifying Dr. Trafton as the Company President and Henry Schur as the VP of Marketing; both being proposed for Board Members.

Exhibit Q

Exhibit Q is a copy of a Simplex Medical Systems, Inc. Press Release dated August 13, 1996, stating that Dr. Trafton is the Company President.

CONCLUSIONS

Applicants are entitled to have pending applications "Made Special" under 37 C.F.R. 1.102 upon payment under 37 C.F.R. 1.17 (i) and filing a petition accompanied by a statement by the applicant, assignee, or an attorney/agent of record:

1) Infringing product is actually on the market.

   The Petitioner has included photographs, brochures, and a sales receipt of the alleged infringing item. The Petitioner believes that this requirement has been met.

2) A rigid comparison of the alleged infringing apparatus with the claims has been made.

   The Petitioner has included two photographs that identify the features respective to the pertinent claims within the pending application. The Petitioner has identified each item within each of the pertinent claims. The Petitioner believes that this requirement has been met.

3) A careful and thorough search of the prior art has been completed.

The Petitioner has completed a search of the prior art to the best of his knowledge and has submitted a copy of the IDS forms that are in process of being provided to the USPTOto be included within the pending application. The Applicant believes that based upon the claims granted in the parent application (USPN 5,839,946, issued November 24, 1998) and the limitations with respect to size and shape of the apparatus as being limiting factors within the claims herein; the pending claims would be allowed when compared against the known prior art. The Petitioner believes that this requirement has been met.

The Applicant further believes that the pending claims are no broader in scope than the claims issued by the parent application.

Further, the Petitioner believes the Petitioner has demonstrated that the alleged infringing party (SMLX Technologies, Inc. previously Simplex Medical Systems, Inc. and Analyte Diagnostics, Inc.) are under a Confidentiality Agreement (Exhibit D). Mr. Schur was the President of Analyte Diagnostics, Simplex Medical Systems, and SMXL Technologies. The Petitioner believes the Petitioner has shown the alleged infringing party improperly filed a US Patent Application (No. 08/746,737) on November 15, 1996, including the Petitioner as an Inventor. The representing Attorney withdrew upon conclusion of potential improper activities by the Applicants (Schur, et al.). The Petitioner believes that the Petitioner has shown that the representative (Attorney Van Der Wall) of the Alleged Infringing Party and the Alleged Infringing Party were and are fully aware of the Confidentiality Agreement (Exhibit D) and the Parent Application / Issued Patent of the Petitioner (Exhibit B) and continues to support his clients manufacture, distribution and sale of the alleged infringing apparatus (Exhibits M, N, and O). Applicant respectfully requests the Commissioner take the presented willful actions of the alleged Infringing Party and representation into consideration when reviewing this Petition to Make Special.

Petitioner believes that the Petitioner has provided and fulfilled all requirements under the guidelines to have a Pending Application made Special with respect to alleged infringement. Applicant has included the required fee of $130 for the respective petition. Petitioner earnestly requests the Commissioner grant the Petition to Make Special under the rights designated with respect to the current alleged infringement.

If the Commissioner requires any additional information, a telephone call to the Petitioner (Dr. Reuben Hertz) at (954) 764-4074 is respectfully solicited.

Respectfully submitted,

Reuben Hertz

Petitioner

Contact Information:
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In The United States Patent and Trademark Office

Patent App No. 09/939,865
Filed: August 27, 2001
Applicant: Reuben Hertz
Examiner/GAU: Unknown / 3723

Certificate of Mailing: I certify that on the date below this document and referenced attachments, if any, will be deposited with the U.S. Postal Service as an Express Mail (# ET472303996US) in an envelope addressed to "ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, DC 20231."

2001 September 17 _____

Reuben Hertz, Applicant

Attachments:
Petition to Make Special (19 Pages)
Exhibits A-Q
Fee Transmittal Form
Check 1601 for $130
Return Postcard
IDS copy (Form)

§

Exhibit A

Van Der Wall to Hopen (representing Hertz)
Correspondence Dated August 20, 2001

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TELEPHONE (561) 691-4670
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August 20, 2001

BY FAX

Anton J. Hopen, Esquire
Smith & Hopen, P.A.
15950 Bay Vista Drive
Suite 220
Clearwater, Florida 33760

Re: Alleged Infringement of U.S. Patent No. 5,839,946 Issued to Reuben Hertz
Our reference: 857-40
Your reference: 1213.01

Dear Mr. Hopen:

We have been furnished a copy of your demand letter dated August 10, 2001 written to our client SMLX Technologies, Inc. concerning the subject matter. This letter is intended to respond thereto.

We begin our analysis of the issue of infringement by examination of the nature of the claims in the Hertz patent. There are three independent claims, claims 1, 10 and 20. If none of these three claims are infringed, no claim is infringed. Claim 1 is limited to a structure wherein the glass delivery conduit abuts and is contiguous with the side wall. There is a prosecution history estoppel concerning this limitation in the file history making it essential that it be found in the accused device for there to be an infringement of claim 1. Clearly our client's accused product lacks this structure and therefore there is no infringement of claim 1. Claim 20 includes a limitation of a rubber stopper. Just as clearly we lack the rubber stopper and therefore infringement does not exist in all probability of claim 20.

Claim 10 nominally appears to be infringed by our client's accused product, but you cannot infringe an invalid claim. Claim 10 is clearly anticipated by Schaechter, U.S. Patent No. 3,626,841,

issued December 14, 1971, and therefore claim 10 is unequivocally invalid. A copy of Schachter is enclosed for your information. This leaves only claims dependant on claim 10 as a possible basis to assert infringement, none of which contain subject matter that would be allowable in the face of secondary references that we have researched for an impending reexamination request concerning the Hertz patent. None of the references we will be using in the reexamination request were cited by the Hertz patent examiner. We are frankly of the view that none of the presently existing Hertz patent claims will survive reexamination, and we doubt there will be anything allowable left at all.

Accordingly, the filing of a patent infringement lawsuit based upon the Hertz patent for alleged infringement by the SMLX Airbrator or any other product made in accordance to its design would constitute frivolous litigation for which an award of reasonable attorneys fees on behalf of the Defendant(s) would be sought and quite likely to be granted. Further, any such suit would be the subject of a motion to stay pending the resolution of the reexamination.

We will be happy to provide you with a complete courtesy copy of the reexamination request when it has been completed if you request that we do so. If you have any questions or comments, please do not hesitate to contact us.

Very truly yours,

ROBERT J. VAN DER WALL

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McHALE, SLAVIN & VAN DER WALL

Exhibit B

Hertz, USPN 5,839,946

US005839946A

United States Patent [19]

Hertz

[11] Patent Number: 5,839,946

[45] Date of Patent: Nov. 24, 1998

[54] **HANDHELD APPARATUS FOR PROPELLING PARTICULATE MATTER AGAINST A SURFACE OF A PATIENT'S TOOTH, AND METHOD**

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[21] Appl. No.: **517,379**

[22] Filed: **Aug. 21, 1995**

[51] **Int. Cl.**[6] **B24C 7/00**

[52] **U.S. Cl.** **451/90**; 451/99

[58] **Field of Search** 451/102, 90, 38, 451/99

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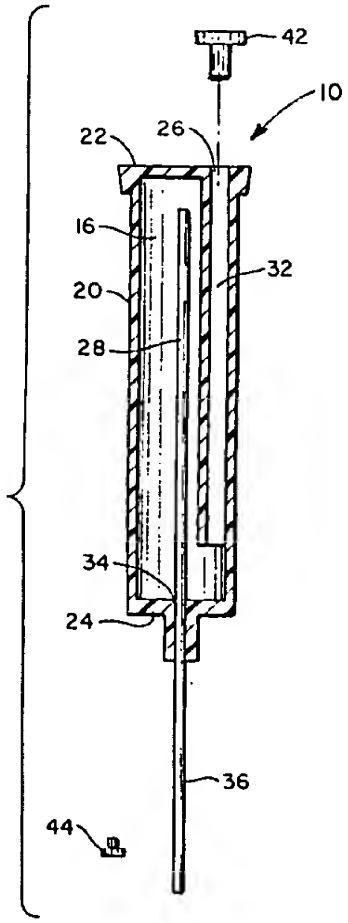
Primary Examiner—Robert A. Rose

Attorney, Agent, or Firm—Gerald E. Linden

[57] **ABSTRACT**

A disposable apparatus for propelling particulate matter against a surface of a target material includes, a mixing chamber having a chamber wall and a gas receiving port in the chamber wall in fluid communication with the compressed gas source and having a mixture discharge port in the chamber wall, a gas delivery conduit extending from the gas receiving port into the chamber, a mixture discharge conduit extending from the mixture discharge port into the chamber, and a quantity of particulate matter inside the chamber. A method is provided for propelling particulate matter against a surface of a target material using the above-described apparatus, including the steps of delivering a stream of gas into the air delivery conduit and into the mixing chamber from the gas source, so that the gas stream blows through the quantity of particulate matter, causing the particulate matter to mix with the gas stream, forming a gas and particle mixture, and discharging the mixture through the discharge conduit and the discharge port to strike the surface of the target material.

30 Claims, 4 Drawing Sheets



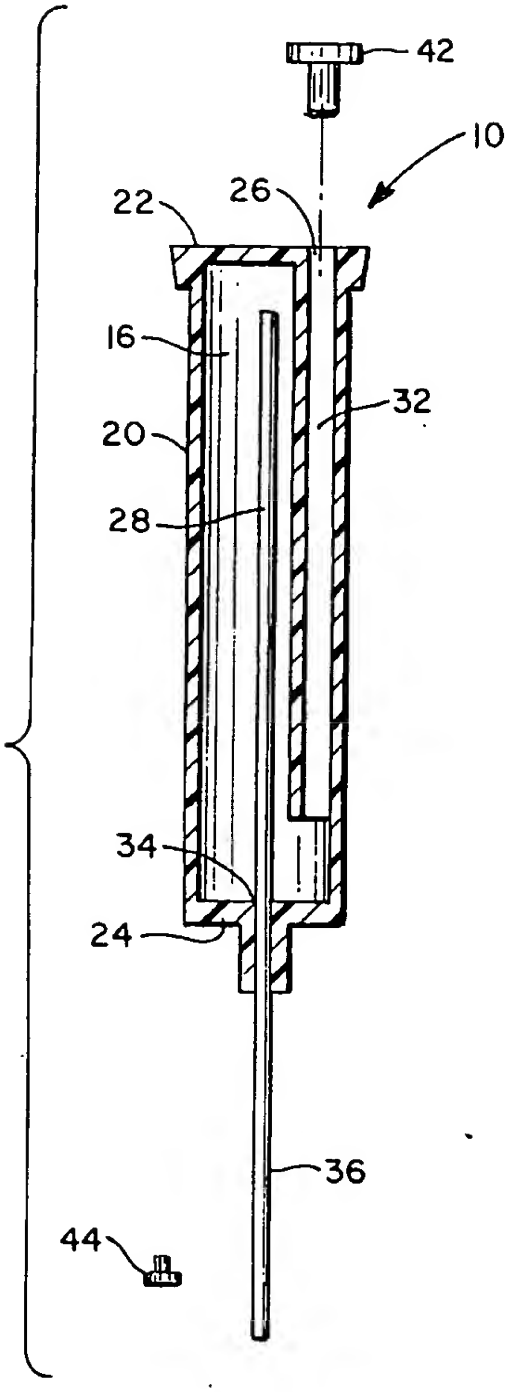


FIG. 1

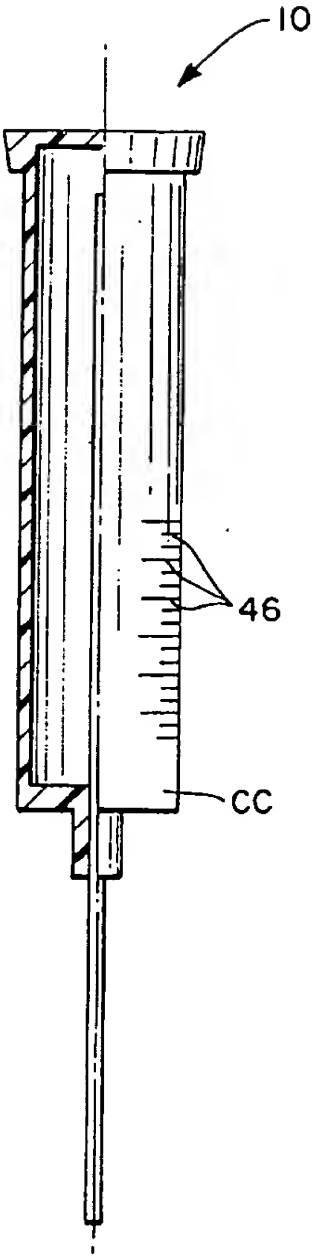


FIG. 2

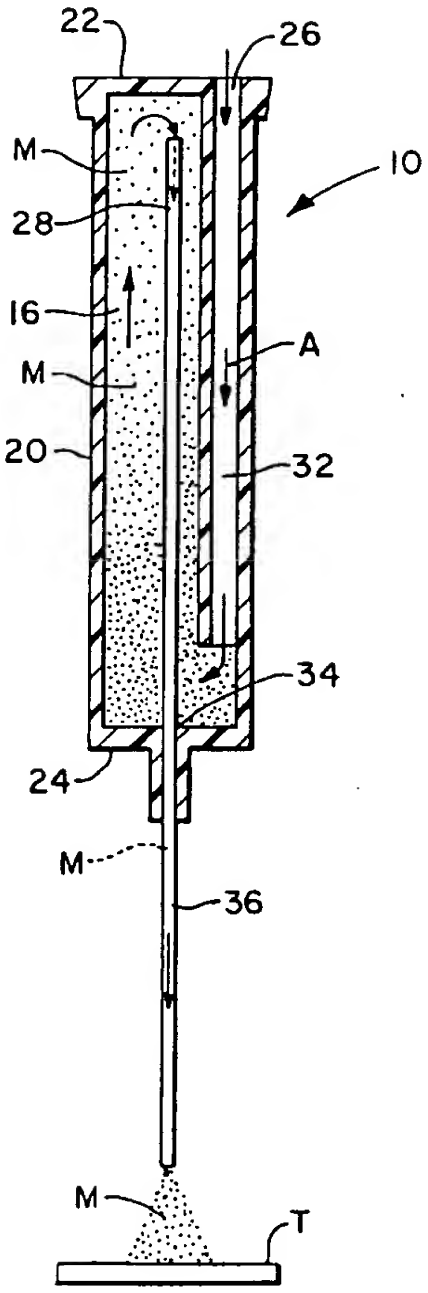


FIG. 4

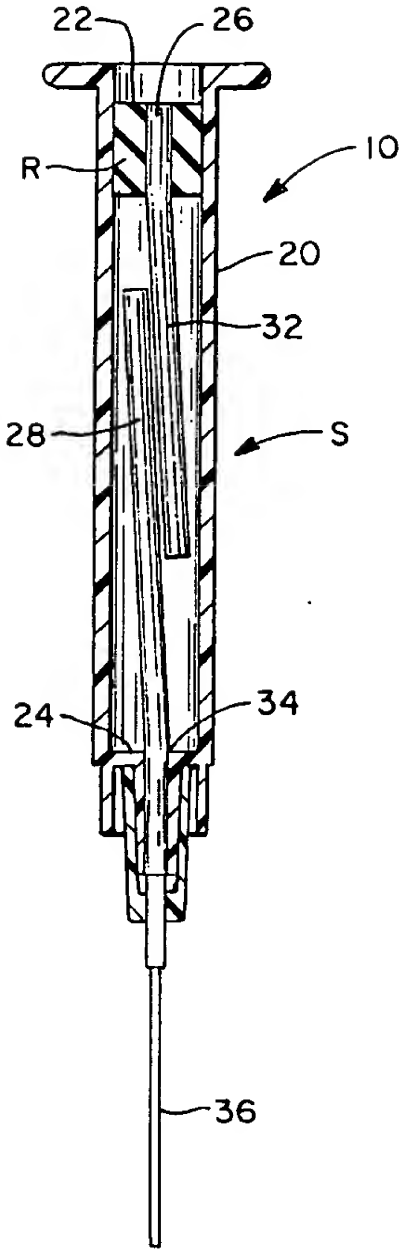


FIG. 5

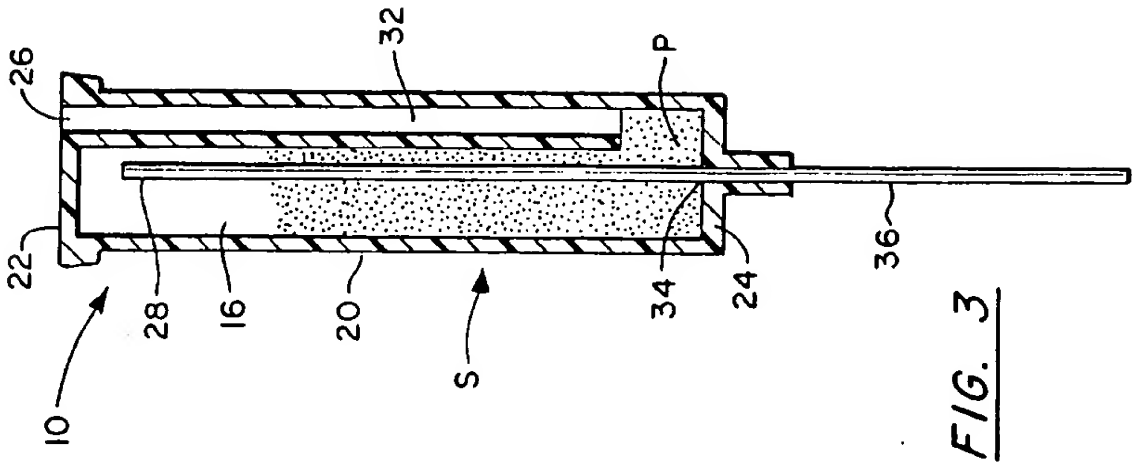


FIG. 3

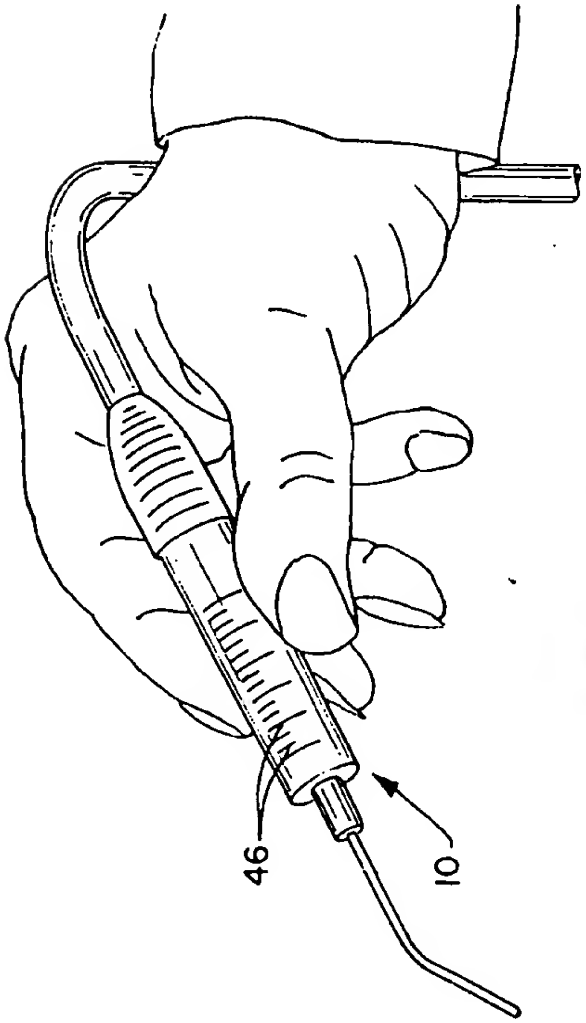


FIG. 2A

HANDHELD APPARATUS FOR PROPELLING PARTICULATE MATTER AGAINST A SURFACE OF A PATIENT'S TOOTH, AND METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to the field of devices for propelling particulate matter against a surface of target material to sand blast, abrade, etch, erase, cut, smooth, clean, polish and harden the surface. More specifically, the present invention relates to a totally disposable, inexpensive particle propelling apparatus powered by a compressed gas source, including a cylindrical chamber having a chamber wall and a gas receiving port in the chamber wall in fluid communication with the compressed gas source, a gas delivery conduit extending from the gas receiving port into the chamber, a mixture discharge port in the chamber wall, a mixture discharge conduit extending from the mixture discharge port into the chamber, a particle directing hollow tube in fluid communication with the discharge port, and a measured quantity of a specific particulate matter sealed inside the chamber. The apparatus is preferably made of inexpensive plastic and metal, so that the entire unit and contents are cleanly manufactured and sealed and, if necessary, can be sterilized at the place of manufacture, and the entire apparatus is economically replaced rather than re-used.

A method of apparatus use is also provided. Pressurized gas is delivered through the gas receiving port, the gas delivery conduit and into the chamber from the gas source. The velocity of the gas stream progressively blows through the particulate matter and causes the particulate matter to cyclically spin in the chamber, mixing with the gas stream. The gas and particle mixture passes and accelerates through the discharge conduit, the discharge port, and the directing tube, and exits the apparatus to strike the target material surface.

2. Description of the Prior Art

There have long been devices and methods for impacting surfaces of a target material with specific particulate matter. This may be done for a variety of reasons, such as to remove foreign material, roughen or etch the surface to enhance bonding quality, or to dull an unsightly shine. As the gas and particulate matter bombard the target material at high speed, the impact of the particles causes layers of the target material to sheer one at a time. This process of material removal is known as etching and also as sand-blasting.

Devices of many sizes and types are available for this process, and they are powered by many types of compressed gases such as air, nitrogen, oxygen, and others. Large devices have been provided for cutting through metals and smoothing surfaces of casting parts, while small ones have been designed for the art industry and dentistry. All of these devices operate on the physical property that gas at higher pressure flows and accelerates toward and into gas at lower pressure. When particulate matter is mixed with gas at higher pressure, it is accelerated with the gas.

This technique utilizes kinetic energy (Ek) from particles entrained in a high-velocity stream of gas to remove material structure. The term kinetic energy was coined by Lord Kelvin and is defined mathematically by the equation Ek equals one half the mass times the square of the velocity.

While many devices operating on this principle have been designed specifically for the art industry, construction, general industry, dental, and veterinary services, none may be considered disposable, since their cost is many times more than the profit derived from a single procedure. As a result, these devices are designed for long term use and repeated cleaning and maintenance cycles. For example, the devices are designed to be refilled with particulate matter and to operate at high pressures. These functional characteristics require that existing devices have larger overall sizes and bulky nozzles made of expensive carbide alloys. Since these devices are not disposable, individuals must be skilled to maintain, clean, refill and re-assemble them. This presents an opportunity for unit malfunction for contamination of the material and of the user, and for loading with inappropriate and even dangerous particulate material by mistake.

Examples of these prior devices include that described in Fernwood, U.S. Pat. No. 4,941,298, issued on Jul. 17, 1990. Fernwood discloses a rear reservoir micro sandblaster which includes a hollow tubular handle with a nozzle at one end for dispensing a mixture of a solid material and a gaseous medium, and a compressed air and solid particulate material receiving member at the other end of the handle. The nozzle section of the apparatus contains a mixing chamber where a vacuum is created by the flowing pressurized gaseous medium, drawing solid material into the chamber from a rear reservoir. Problems with Fernwood are that it is too costly to be disposable; it draws particulate matter from a container using a vacuum rather than by more efficient blow through mixing of as per our invention, and is thus sensitive to variations in material and gas moisture levels, and requires an unclogging mechanism. Fernwood operates at relatively high pressures, 80–100 psi, requiring a special tap into the air lines and limiting the range of operational pressures. In addition, Fernwood requires special training to set up and use, cannot be cost effectively and completely sterilized between use, cannot deliver varying sizes of particles, and is contaminated after every use.

The apparatus disclosed in the Microetcher™ brochure is either the same or very similar to that of Fernwood. Another similar device, with a forward material reservoir, is disclosed in the Mirage/Chameleon Dental Products, Inc. brochure and is called the Handiblaster™. Other similar devices are the Microetcher II™ disclosed in brochure headed: "Now With Autoclavable Tip" and the AEC Air Eraser™ revealed in Paasche™ operating instructions.

It is thus an object of the present invention to provide a sandblasting apparatus which delivers a mixture gas and particulate matter against a surface of target material.

It is another object of the present invention to provide such an apparatus which is provided pre-loaded from the factory with a select quantity of specific particulate matter and which is sealed.

It is another object of the present invention to provide such an apparatus which accelerates and directs particulate matter through the barrel of a hollow tube, which can be bent to become omni-directional, which is long enough to deliver the matter at a substantially uniform velocity, and which is narrow enough to focus discharged matter over a small target in a confined area.

It is another object of the present invention to provide such an apparatus which is marked with a grid to measure the quantity of particulate matter discharged and which is color-coded to identify the contents inside the given apparatus.

It is another object of the present invention to provide such an apparatus which has a mixing chamber narrow enough to be handled in the manner of a writing instrument

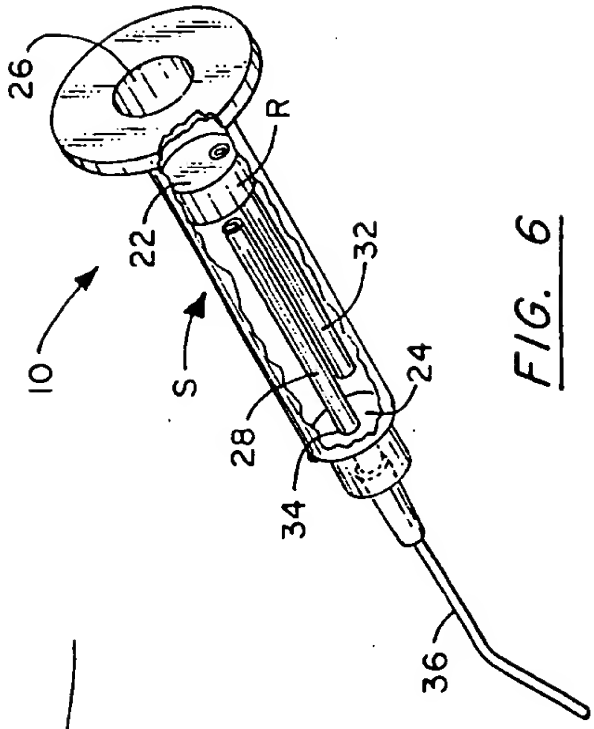


FIG. 6

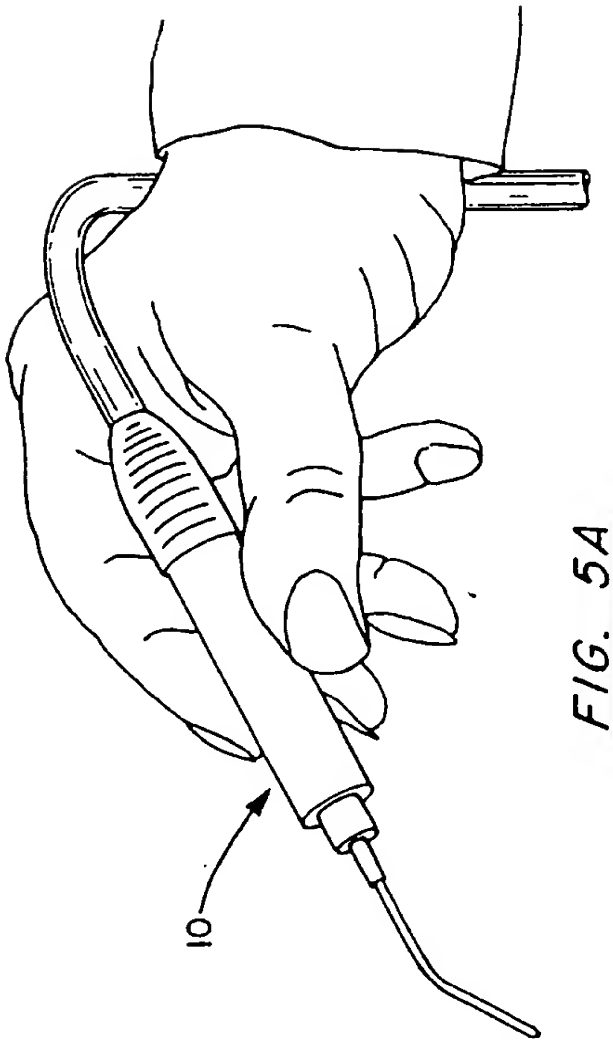


FIG. 5A

such as a pen, which is balanced and operational at all orientations and external pressures, and is totally sterilizable and disposable.

It is still another object of the present invention to provide such an apparatus and method which creates a turbulent mixture of gas and particulate matter via blow through mixing of the gas stream on the particulate matter.

It is finally an object of the present invention to provide such an apparatus which is sufficiently inexpensive to manufacture to be disposable and to manufacture cleanly so that contamination is not compromised during filling, and which is totally recyclable.

SUMMARY OF THE INVENTION

The present invention accomplishes the above-stated objectives, as well as others, as may be determined by a fair reading and interpretation of the entire specification.

A disposable apparatus powered by compressed gas is provided for propelling particulate matter against a surface of a target material, including a mixing chamber having a chamber wall and a gas receiving port in the chamber wall in fluid communication with a compressed gas source and having a mixture discharge port in the chamber wall, a gas delivery conduit extending from the gas receiving port into the chamber, a mixture discharge conduit extending from the mixture discharge port into the chamber, and a quantity of particulate matter inside the chamber, where a stream of gas having a pressure is delivered into the gas delivery conduit and into the mixing chamber from the gas source, the velocity of the gas stream progressively blows through the quantity of particulate matter and causes the particulate matter to mix with the gas stream, forming a gas and particle mixture which enters and passes through the discharge conduit and the discharge port, and exits the apparatus to strike the surface of the target material. The mixing chamber wall preferably has a tubular side wall portion and two opposing end wall portions. The apparatus preferably additionally includes a hollow particulate matter directing tube. The chamber is optionally formed of a translucent plastic, and is optionally color-coded to identify the particulate matter contained within the chamber.

An apparatus is also provided for propelling particulate matter against a surface of a target material, including a mixing chamber having a chamber wall and a gas receiving port in the chamber wall and having a mixture discharge port in the chamber wall, a gas delivery conduit extending from the gas receiving port into the chamber, a mixture discharge conduit extending from the mixture discharge port into the chamber, and a quantity of particulate matter inside the chamber.

A method is provided of propelling particulate matter against a surface of a target material using the above-described apparatus, including the steps of delivering a stream of gas into the gas delivery conduit and into the mixing chamber from the gas source, so that the flow of the gas stream progressively blows through the quantity of particulate matter, causing the particulate matter to mix with the gas stream, forming a gas and particle mixture, and discharging the mixture through the discharge conduit and the discharge port to strike the surface of the target material.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, advantages, and features of the invention will become apparent to those skilled in the art from the following discussion taken in conjunction with the following drawings, in which:

FIG. 1 is a cross-sectional side view of the preferred embodiment of the inventive particle-propelling apparatus. The particulate matter and gas source are omitted.

FIG. 2 is a partial cross-sectional side view of the apparatus of FIG. 1, revealing some of the outer chamber side wall having the optional grid measuring markings and a circumferential color-code band. FIG. 2*a* is a perspective view of the apparatus of FIG. 2 in the hand of a user ready for operation.

FIG. 3 is a view as in FIG. 1, showing the apparatus with the particulate matter added.

FIG. 4 is a view as in FIG. 3, with the apparatus in operation, discharging the gas and particulate matter mixture toward a surface of a target material.

FIGS. 5 and 6 show alternative embodiments of the claimed apparatus, formed from a conventional industrial syringe. FIG. 5*a* is a perspective view of the apparatus of FIG. 5 in the hand of a user ready for operation.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure.

Reference is now made to the drawings, wherein like characteristics and features of the present invention shown in the various FIGURES are designated by the same reference numerals.

First Preferred Embodiment

Referring to FIGS. 1–4, a disposable particle propelling apparatus **10** is disclosed for propelling particulate matter P against target material T. The apparatus **10** includes a cylindrical mixing chamber **16** having a chamber wall **20** and two end wall portions **22** and **24**, respectively. Apparatus **10** is powered by a compressed gas source such as an air compressor or a compressed gas cylinder (not shown), which connects in fluid communication to the gas receiving port **26** of end wall portion **22**. The gas delivery conduit **32** extends from the gas receiving port **26** into mixing chamber **16**. End wall **24** has a mixture discharge port **34**. A mixture discharge conduit **28** extends, in fluid communication from mixture discharge port **34** into mixing chamber **16**. A particle directing tube **36** is provided in fluid communication with discharge port **34** and extends opposite discharge conduit **28** outside from mixing chamber **16**.

A quantity of particulate matter P is sealed inside chamber **16**, the quantity being sufficient to only partially fill chamber **16**, leaving space for gas and particulate matter P to mix. The complete sealing of the particulate matter P gives matter P a virtually unlimited shelf life and protection from contamination. Mixing chamber **16** provides a gas-tight seal to maintain particle sterility and to prevent gas leakage during operation. An inlet cap **42** and a tip cap **44** seal gas receiving port **26** and mixture discharge port **34**, respectively, and are removed when apparatus **10** is to be connected to the compressed gas source for use. Volume grid markings **46** are preferably provided on the wall side portion **20** of chamber

16 so that the quantity of particulate matter P used can be measured and visually observed when wall 20 is constructed of a clear of opaque material. Chamber wall 20 may also be color-coded to identify the type of particulate matter P. The color code marking CC may indicate the particle size and the type of particulate matter P.

Tube 36 serves to both direct and accelerate the discharging gas and particulate matter P mixture. As result, the particulate matter P can be applied to a focused region very precisely and at a uniform velocity. Since apparatus 10 is disposable, tube 36 can be inexpensively thin walled to sustain a limited use. Tube 36 is manually bendable permitting it to be quickly set to any angle, making the discharge omni-directional, to provide access to-hard-to reach surfaces. Tube 36 preferably has a preset orifice diameter to accommodate a given size and type of particulate matter P, and is preferably made of metal, but may also be formed of suitable plastic or other material.

Chamber 16 is preferably an integrated chamber with balanced distribution of weight which is preferably slender enough to hold and manipulate as though it were a writing instrument. The direct, blow through, turbulent mixing within chamber 16 makes apparatus 10 operational at all orientations relative to the target surface and to the direction of gravity. The slender construction makes chamber 16 able to access narrow spaces and operate in small confined areas. Chamber 16 can receive and function with varying gas pressures applied to gas receiving port 26, selected to accelerate particles to various desired velocities for various given tasks. Turbulent mixing of particulate matters P directly in the path of the gas stream within chamber 16 enables apparatus 10 to deliver particulate matters P of a wide range of sizes, and to mix and deliver a wide range of particulate matter types. The direct blow through mixing in chamber 16, permits operation at very low pressures, thereby increasing the range of operational pressures which may be selected.

Apparatus 10 contains no moving parts and is preferably made of disposable plastic, so that particulate matter P and apparatus 10 can be sterilized at the factory, and apparatus 10 replaced rather than re-filled and re-used. Apparatus 10 is designed to withstand common sterilization techniques such as Autoclave, chemical treatments, and irradiation. Contemplated apparatus 10 construction materials may include but are not limited to plastic, stainless steel, Delrin™ and Teflon™. Apparatus 10 is light-weight, manufactured to be re-cyclable, and easy to use and replace without training or maintenance.

Apparatus 10 can be constructed from an adapted disposable syringe S of a type which is extremely common in the health care industry. See FIGS. 5 and 6. Needle 36 is attached to a standard syringe needle with a dulled tip, and formed of either metal or plastic. Gas receiving port 26 is a hole bored into a standard rubber syringe stopper R separated from a standard syringe plunger. Mixture discharge port 34 is the existing discharge opening of the syringe S, while standard tubing can be used for gas delivery conduits 32 and 28.

Method

In practicing the invention, the following method may be used. A stream of gas A is delivered through gas receiving port 26 and gas delivery conduit 32 into chamber 16 from the gas air source (not shown). The gas stream A blows through the particulate matter P and causes the particulate matter P to mix with the gas stream in chamber 16. See FIG. 4. The air and particle mixture M enters and passes through discharge conduit 28, discharge port 34 and directing tube 36, and exists apparatus 10 to strike the target material T, without generating heat, vibration, appreciable noise levels, and having no moving parts.

In this manner there is provided a disposable apparatus powered by a compressed gas source for propelling particulate matter against a surface of a target material, more particularly against a surface of a dental patient's tooth, within the patient's mouth. The apparatus includes a mixing chamber having a chamber wall and a gas receiving port in the chamber wall in fluid communication with the compressed gas source and having a mixture discharge port in the chamber wall, a gas delivery conduit extending from the gas receiving port into the chamber, a mixture discharge conduit extending from the mixture discharge port into the chamber, and a quantity of particulate matter inside the chamber, wherein a steam of gas is delivered into the gas delivery conduit and into the mixing chamber from the gas source, the gas stream blows though the quantity of particulate matter and causes the particulate matter to mix with the gas stream in a mixing section on the chamber, forming a gas and particle mixture which enters and passes through the discharge conduit and the discharge port, and exits the apparatus to strike the surface of the patient's tooth.

The mixing chamber wall has a tubular side wall portion and two opposing end wall portions. The particulate matter does not completely fill said chamber. The chamber has a delivery conduit extending into the particulate matter, the chamber has a mixture discharge conduit extending into the mixing section of the chamber. A tubular particulate matter directing bendable tube is in fluid communication with the discharge port and extends outside and away from the chamber. The chamber may be formed of plastic, and may be color-coded to identify the particulate matter contained within the chamber.

Using this apparatus, particulate matter may be propelled against a surface of a target material by delivering a stream of gas into the gas delivery conduit and into the mixing chamber such that the gas stream blows through the particulate matter, thereby causing the particulate matter to mix with the gas stream, forming a gas/particle mixture, and discharging the gas/particulate mixture against a surface of the target.

While the invention has been described, disclosed, illustrated and shown in various terms or certain embodiments or modifications which it has assumed in practice, the scope of the invention is not intended to be, nor should it be deemed to be, limited thereby and such other modifications or embodiments as may be suggested by the teachings herein are particularly reserved especially as they fall within the breadth and scope of the claims here appended.

I claim as my invention:

1. Handheld apparatus for propelling particulate matter against a surface of a patient's tooth, comprising:

a chamber having a sidewall, a first end wall at a one end of the chamber and a second end wall at an opposite end of the chamber;

a gas-receiving port in the first end wall;

a gas-delivery conduit disposed within the chamber and extending in fluid communication from the gas-receiving port towards the second end wall;

a discharge port in the second end wall;

a discharge conduit disposed within the chamber and extending in fluid communication from the discharge port towards the first end wall;

an elongate particle-directing tube disposed external the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;

wherein:

the gas-delivery conduit abuts and is contiguous with both the sidewall and the first end wall of the chamber.

2. Handheld apparatus, according to claim 1, wherein:

the chamber is cylindrical.

3. Handheld apparatus, according to claim 1, wherein:

the gas-delivery conduit has a proximal end adjacent the gas-receiving port and a distal end spaced from the second end wall.

4. Handheld apparatus, according to claim 1, wherein:

the discharge conduit has a one end adjacent the discharge port and an opposite end spaced from the first end wall.

5. Handheld apparatus, according to claim 1, further comprising:

a quantity of particulate matter (P) disposed within the chamber and only partially filling the chamber.

6. Handheld apparatus, according to claim 5, further comprising:

markings on the chamber allowing visual observation of the quantity of particulate matter within the chamber.

7. Handheld apparatus, according to claim 1, further comprising at least one of:

an inlet cap for sealing the gas-receiving port; and

a tip cap for sealing a distal end of the particle-directing tube.

8. Handheld apparatus, according to claim 1, wherein:

the chamber is formed of a material selected from the group consisting of delrin (tm), teflon (tm), stainless steel and disposable plastic.

9. Handheld apparatus, according to claim 1, wherein:

wherein the sidewall is color-coded to indicate the type of particulate matter contained within the chamber.

10. Handheld apparatus for propelling particulate matter against a surface of a patient's tooth, comprising:

a chamber having a sidewall, a first end wall at a one end of the chamber and a second end wall at an opposite end of the chamber;

a gas-receiving port in the first end wall;

a gas-delivery conduit disposed within the chamber and extending in fluid communication from the gas-receiving port towards the second end wall;

a discharge port in the second end wall;

a discharge conduit disposed within the chamber and extending in fluid communication from the discharge port towards the first end wall;

an elongate particle-directing tube disposed external the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;

wherein:

at least one of the first end wall and the second end wall abuts and is contiguous with the sidewall of the chamber.

11. Handheld apparatus, according to claim 10, wherein:

both of the first end wall and the second end wall abut and are contiguous with the sidewall of the chamber.

12. Handheld apparatus, according to claim 10, wherein:

the first end wall is made of rubber.

13. Handheld apparatus, according to claim 12, wherein:

the first end wall is a rubber syringe stopper; and

the gas-receiving port is a hole bored into the rubber syringe stopper.

14. Handheld apparatus, according to claim 10, wherein:

the sidewall and the second end wall are constructed from a disposable syringe.

15. Handheld apparatus, according to claim 10, further comprising:

a quantity of particulate matter (P) disposed within the chamber and only partially filling the chamber.

16. Handheld apparatus, according to claim 15, further comprising:

markings on the chamber allowing visual observation of the quantity of particulate matter within the chamber.

17. Handheld apparatus, according to claim 10, further comprising at least one of:

an inlet cap for sealing the gas-receiving port; and

a tip cap for sealing a distal end of the particle-directing tube.

18. Handheld apparatus, according to claim 10, wherein:

the chamber is formed of a material selected from the group consisting of delrin (tm), teflon (tm), stainless steel and disposable plastic.

19. Handheld apparatus, according to claim 10, wherein:

wherein the sidewall is color-coded to indicate the type of particulate matter contained within the chamber.

20. Handheld apparatus for propelling particulate matter against a surface of a patient's tooth, comprising:

a chamber having a sidewall, an opening at one end of the chamber, and an end wall at an opposite end of the chamber;

a rubber stopper disposed within the chamber at the one end of the chamber and having a gas-receiving port extending therethrough;

a gas-delivery conduit disposed within the chamber and extending in fluid communication from the gas-receiving port towards the second end wall;

a discharge port in the second end wall;

a discharge conduit disposed within the chamber and extending in fluid communication from the discharge port towards the rubber stopper; and

an elongate particle-directing tube disposed external the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port.

21. Handheld apparatus, according to claim 20, wherein:

turbulent mixing occurs in a portion of the chamber which is adjacent the first end wall.

22. Handheld apparatus, according to claim 20, further comprising:

a quantity of particulate matter (P) disposed within the chamber and only partially filling the chamber.

23. Handheld apparatus, according to claim 22, further comprising:

markings on the chamber allowing visual observation of the quantity of particulate matter within the chamber.

24. Handheld apparatus, according to claim 20, further comprising at least one of:

an inlet cap for sealing the gas-receiving port; and

a tip cap for sealing a distal end of the particle-directing tube.

25. Handheld apparatus, according to claim 20, wherein:

the chamber is formed of a material selected from the group consisting of delrin (tm), teflon (tm), stainless steel and disposable plastic.

26. Handheld apparatus, according to claim 20, wherein:

the sidewall is color-coded to indicate the type of particulate matter contained within the chamber.

27. Handheld apparatus, according to claim 10, wherein:

the particle-directing tube is bendable.

28. Handheld apparatus, according to claim 10, wherein:

the particle-directing tube is made of a material comprising metal and plastic.

29. Handheld apparatus, according to claim 10, wherein:

the particle-directing tube is of sufficient length to reach all surfaces of all teeth within a patient's mouth.

30. Handheld apparatus, according to claim 10, wherein:

the chamber has an axis;

a proximal portion of the particle-directing tube extends axially from the second end wall;

a distal portion of the particle-directing tube extends at an angle to the axis.

* * * * *

Exhibit C

Schacter USPN 3,626,841

United States Patent

[11] 3,626,841

[72] Inventor: Zvi Harry Schachter
16247 Dickens St., Encino, Calif. 91316

[21] Appl. No. 838,741
[22] Filed July 3, 1969
[45] Patented Dec. 14, 1971

[54] **ABRASIVE PROPELLENT APPARATUS**
5 Claims, 3 Drawing Figs.

[52] U.S. Cl. 51/8
[51] Int. Cl. B24C 3/06
[50] Field of Search 51/8, 12, 11; 32/58

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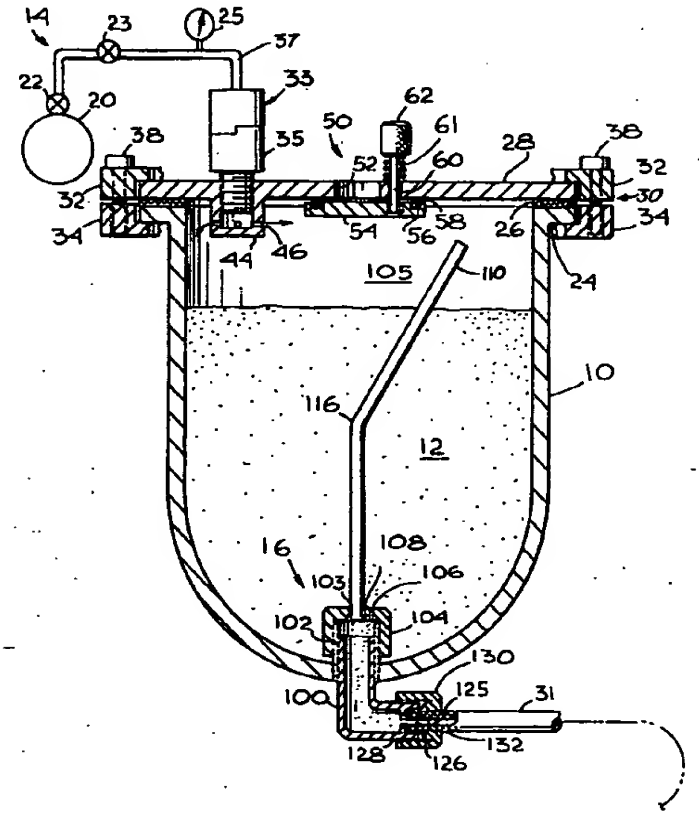
Primary Examiner—Lester M. Swingle
Attorney—Lindenberg, Freilich and Wasserman

ABSTRACT: An apparatus for dispensing at sonic velocity a jet stream of a dispersion of flowable material in a gas. The apparatus includes a container for storing a body of flowable material and a mixing chamber associated with the bottom of the container. The mixing chamber contains an orifice communicating the chamber with the body of material. A tubing connects the chamber with the pressurized head space above the material. The pressure drop through the tubing provides a pressure differential metering material through the orifice into the chamber.



ABRASIVE PROPELLENT APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a novel and an improved apparatus for dispensing finely divided flowable material and, more particularly, the present invention relates to an improved apparatus for metering abrasive grains into a dispensing gas in a single, simplified operation.

2. Description of the Prior Art

The uses of propelled mixtures of gas and flowable abrading material are expanding quite extensively. Since there is no contact between the tool and the workpiece, a gas-propelled suspension of abrasive particles can cut without shock and without substantially raising the temperature of the workpiece. The little heat produced is immediately removed by the propellent gas. A wide variety of hard and brittle materials can be cut, shaped, deburred, cleaned, drilled, etched, or abraded. These operations can be performed on semiconductors, ceramics, glass, fragile crystals, and other materials likely to shatter, melt, or otherwise deteriorate with the use of ordinary cutting or abrading tools.

Apparatus presently available for this purpose utilize vibration to create a suspension of the particles in the gas and utilize suction to mix the suspension with the propellent stream. Such apparatus are very complicated and require specifically manufactured intricate parts and have poor maintenance records rendering the cost of construction and operating these apparatus relatively expensive.

OBJECTS AND SUMMARY OF THE INVENTION

Therefore, an object of this invention is the provision of an apparatus for dispensing a metered quantity of flowable material dispersed in a stream of gas and for delivering this mixture as a compound jet stream to a workpiece for variety of purposes and operations.

A further object of the invention is to provide such an apparatus in a simplified and inexpensive form and which operates with no moving parts and high reliability for long periods of operation with substantially few parts being subject to wear and replacement.

Yet another object of the invention is the provision of an abrasive blast apparatus including a simplified and convenient variable adjustment of the amount of flowable material present in the jet blast stream.

Still another object of the invention is the provision of an apparatus capable of dispensing flowable material in solid form, liquid form, or combination thereof of various specific gravities and viscosities which can be delivered to a workpiece at sonic velocity.

A further object of the invention is to provide a simple, inexpensive and reliable abrasive dispensing apparatus constructed of readily available conventional parts and operable without the use of electric power.

These and other objects and many attendant advantages of the invention will become apparent as the description proceeds.

These objectives are accomplished according to the invention by an apparatus which generally includes a container for storing a body of flowable material, means for applying gas pressure to the head space of said container above the body and mixing means associated with a lower portion of the container. The mixing means includes a mixing chamber communicating through an orifice with the body of material and through a length of tubing with the head space whereby an adjustable pressure drop is created across the orifice. Thus, flowable material passes into the chamber only when a differential pressure exists across the orifice.

This pressure drop is provided without the necessity of moving parts and is adjustable so that the amount of flowable material entering the chamber is readily increased or decreased by simply adjusting the pressure in the head space in the same direction as it is desired to change the flow rate of the material into the chamber. The range of flow rate of the material may be further adjusted by increasing or decreasing the orifice size. The gas entering the chamber through the tubing fluidizes the material to form a jet stream. The apparatus may further include a conduit communicating with the outlet of mixing chamber. The conduit is preferably formed of a flexible material resistant to the pressures of the system and terminating in a nozzle for delivering the mixture of flowable material and gas in a compound jet stream at sonic velocity to the article or workpiece to be polished, cut, shaped, or worked as desired. A clamp valve may be applied to the flexible conduit near the nozzle.

The invention will now become better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front plan view partly in section illustrating an embodiment of the apparatus of the invention;

FIG. 2 is a side view partly in section illustrating the details of the hand piece; and

FIG. 3 is a side view of an alternate barrel structure for the hand piece.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the FIGS. 1 and 2, the apparatus according to the invention generally comprises a container 10 for flowable material 12, a gas supply system 14 for pressurizing the container, a gas and flowable material mixing chamber 16, and an abrasive jet delivery section 18. The container may be formed of a transparent material such as plastic or glass and may contain a generally cylindrical upper portion and a tapered funnel-shaped lower portion providing a natural feed of the flowable material toward the mixing chamber 16.

The gas supply system includes a high-pressure gas source 20, such as a compressor or a high-pressure storage bottle and a high-pressure regulator 22, for coarse adjustment, low-pressure regulator 23 for fine adjustment, and a pressure gauge 25. The abrasive jet delivery system includes a nozzle 27, valve 29 and a flexible conduit 31 connecting the nozzle 27 to the mixing chamber 16.

An outwardly facing lid receiving flange 24 is part of the top of the container. A sealing gasket 26 is disposed between the flange 24 and lid 28. A gastight assembly is formed by means of a two part clamp 30 having an upper portion 32 gripping the lid and a lower member 34 gripping the flange. The clamp is assembled by inserting a plurality of threaded bolts 38, through the clamping portions 32 and engaging the threads of the bolts with the threads provided in lower member 34 to press the lid 28 against the flange 24.

The pressurizing gas conduit 37 terminates in a quick disconnect 33, each mating part of which when separated closes to shut off the gas flow from the gas source 20 and to maintain the pressure within the container 10. The mating half 35 of the quick disconnect connected to the container may be either the male or the female portion. The portion 35 may be a threaded fitting extending through the lid 28. The threads extending below the lid 28 are further connected to an inlet fitting 44 having side openings 46 such that the flow of inlet gas is directed away from the top of the body of flowable material 12.

It is preferred to provide a flowable material inlet 50 on the lid 28 of the container rather than to open the clamp and remove the lid each time it is desired to refill the container with abrasive or change the type of abrasive. The inlet may take many forms and as shown, may comprise an aperture 52 in the lid covered by a plate 54. The outer upper edge of the plate is relieved at 56 to form a seat for an O-ring 58. The plate 54 is pivotally mounted on a threaded pin 60 extending through the lid 28. The pin 60 which has a knurled head 62 is surrounded by a spring 61. By grasping the knurled head 62 between two fingers and depressing the spring, the plate will

removed with a tool, a slight variation in wire diameter is experienced, thereby rendering the potentiometer or rheostat nonlinear, whereas, with the inventive apparatus, the abradent stream removes only the potting material and none of the copper of which the wire is made. The apparatus can also be used to strip unwanted baked-on varnish from motor-stator cores.

The apparatus can be utilized in the manufacturing of metallic and nonmetallic parts which require microscopic deburring and which cannot be presently accomplished with a tool touching the workpiece and for working into irregular cavities or where direct approach is not available with a regular tool. For this reason the present production yield is only a percentage of the total production.

Virtually every electrical contact point, as are incorporated in relays and other devices, can be cleaned with the use of the apparatus. Again, if a tool is employed to clean the contact points, some of the parent material is sure to be removed in the process. The apparatus of the present invention would only remove the buildup or the carbon deposit. The apparatus can be used in the opaquing or shading on glass sheeting; the advantage being of the fine control which is available on the small areas which the nozzle can cover.

It is apparent that only the preferred embodiments of the invention have been disclosed. Therefore, this invention may be practiced by suitable substitutions, alterations, and modificatons without departing from the scope of the invention as defined in the following claims.

What is claimed is:

1. An apparatus for dispensing a fluidized suspension of flowable abrasive material in a propelling gas comprising in combination:

a closed container including a tapering lower wall portion for receiving a body of said material, an upper wall portion defining a head space above said body and a top member releasably connected to said upper wall portion;

propellent gas inlet means sealingly received through said top member and having a first end terminating within said head space, said end containing radially directed apertures for pressurizing said head space; and

mixing chamber means including a hollow, tubular member having a first end sealingly received within the bottom of the tapering wall portion and a second end disposed exterior to said container, a first cap member having a first small diameter material inlet orifice and a second larger diameter dispensing gas inlet orifice received over said first end, a length of tubing having a first end received within said first orifice and a second end disposed within said head space and a second cap member having an outlet tubing receiving aperture, said second cap being sealingly received over the second end of said tubular member.

2. An apparatus according to claim 1 further including flowable material filling means comprising an aperture defined in said top member, a closure plate larger than said aperture disposed on the inside surface of the top member and a rotatable, upwardly biased knob means connected to said plate.

3. An apparatus according to claim 1 further including a length of flexible tubing having a first end received within said second cap member and a second end received within a rigid handpiece, a nozzle and shutoff pinch valve and mounting means for mounting said nozzle and valve on said handpiece.

4. An apparatus according to claim 3 in which said handpiece includes a hollow rigid barrel member having a forward end and a rearward end; fastener means on said forward end for engaging said nozzle; clamping means inside and barrel adjacent said forward end for engaging the second end of said tubing; and said valve means includes a pinching lever including a downwardly depending and rearwardly facing flange portion for pinching said tubing closed against the inner wall within the rearward open end of the barrel, a forwardly facing handle portion and an aperture between said portions, pivot means mounted on said barrel adjacent said rearward end and extending through said aperture and bias means mounted on said pivot means for biasing said lever into closed position.

5. An apparatus according to claim 1 further including a source of pressurized gas and a pressure regulator interposed between said source and gas inlet whereby on selected adjustment of said pressure the rate of metering material into said chamber is controlled.

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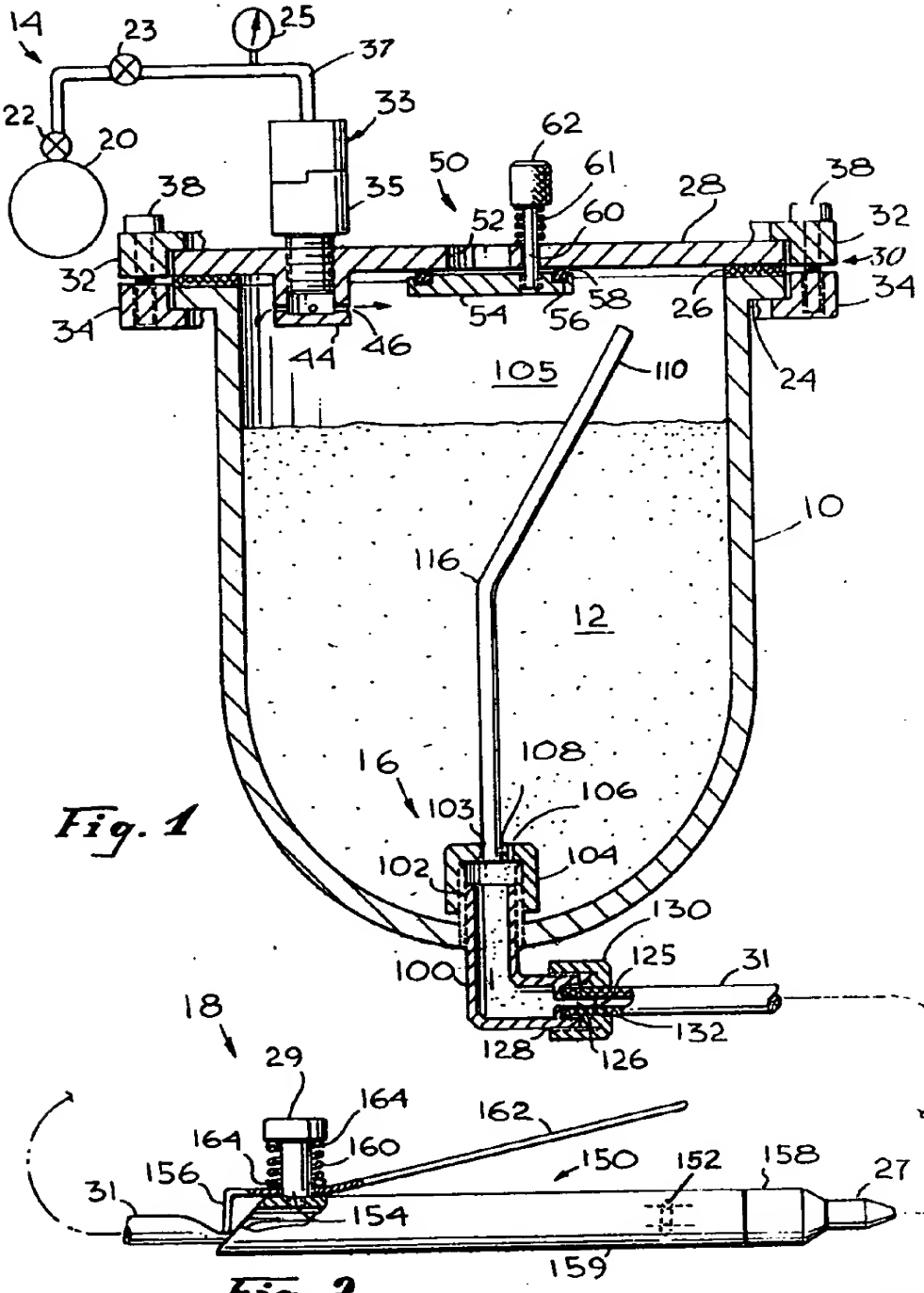

Fig. 1

Fig. 2

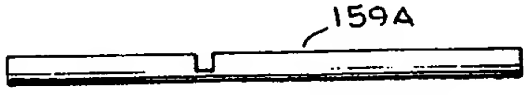

Fig. 3

INVENTOR.
ZVI HARRY SCHACHTER
BY Lindenberg & Freilich
ATTORNEYS

Exhibit D

Schur / Groman / Hertz
Confidentiality Agreement

CONFIDENTIALITY AGREEMENT

Individual recognizes that Reuben Hertz D.D.S., Barry Groman and KIS Technologies have and will have ideas, inventions, trade secrets, process information and other vital information (collectively, "INFORMATION")* which are valuable, special and unique assets of aforementioned parties. Individual(s) agrees that they will not at any time or in any manner, either directly or indirectly, divulge, disclose, utilize or communicate in any manner any information to any party without the prior written consent of Reuben Hertz D.D.S., Barry Groman and KIS Technologies. Individual will protect the INFORMATION and treat it as strictly confidential. A violation by this individual of this agreement shall be a material violation of this agreement and will justify legal and/or equitable relief.

* Information is Defined as any Dental products, processes for Dental use or Methods for Air Abrasion technology as applied to the Dental field.

Signed: Henry B Schur

Print Name: Henry B Schur

Date: 8/22/95

Witness: Barry B Groman

Witness:

Exhibit E

Schur, et al. USPN 5,839,946

US006004191A

United States Patent [19]

Schur et al.

[11] Patent Number: 6,004,191

[45] Date of Patent: Dec. 21, 1999

[54] PARTICULATE MATTER DELIVERY DEVICE

[75] Inventors: Henry B. Schur; John E. Trafton, both of Hallandale, Fla.

[73] Assignee: Simplex Medical Systems, Inc., Hallandale, Fla.

[21] Appl. No.: 08/863,857

[22] Filed: May 27, 1997

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/517,379, Aug. 21, 1995, abandoned, and application No. 08/746,737, Nov. 15, 1996, abandoned.

[51] Int. Cl.[6] B24C 5/04

[52] U.S. Cl. 451/90; 451/101

[58] Field of Search 451/38, 39, 101, 451/102, 90, 99

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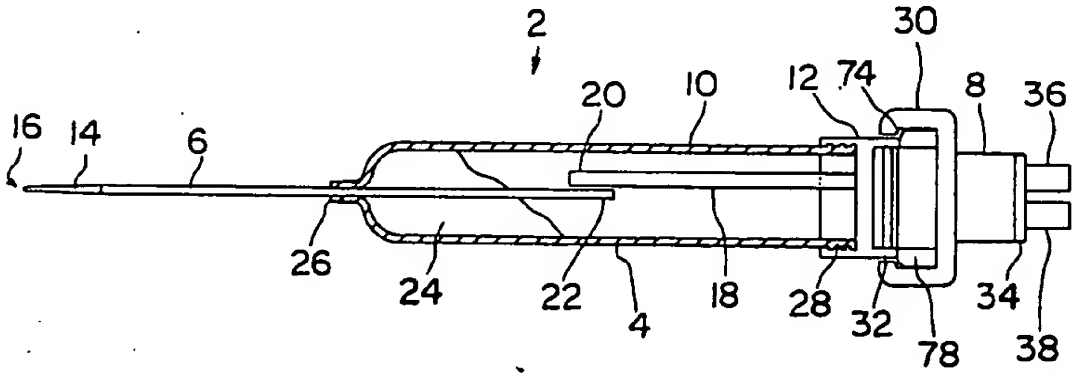
Primary Examiner—Robert A. Rose
Attorney, Agent, or Firm—Robert J. Van Der Wall

[57] ABSTRACT

Disclosed is an improved apparatus for delivery of pressurized particulate matter against a surface or target to abrade, etch, erase, cut, penetrate, smooth, clean, polish and/or harden the surface or target. The most important use to which the present invention is adapted is use by dentists and oral hygienists to very effectively clean teeth, employing a particulate matter such as aluminum oxide, while at the same time having no effect on soft tissue such as the gums. This is accomplished using a prefilled, sealed, and disposable fluidizing chamber and cannula assembly that avoids contamination and which has already been approved by the FDA for dental use. Included is a fluidizing chamber having a discharge end of an inlet tube that is disposed below or overlaps the intake end of the cannula such that the discharge of the inlet tube blows the particulate matter into the fluid above the intake end of the cannula, thereby suspending it therein, without clogging. The invention further provides for a custom designed double acting safety check valve to prevent backflow of particulate matter in the event of a drop in pneumatic pressure, and also to prevent excessive pressure from reaching the fluidizing chamber and cannula in the event of a pressure surge. Another feature of the invention includes a tapered nozzle and optionally bent cannula. The check valve attaches to the pre-existing pneumatic pressure line of a dental office pedestal.

13 Claims, 2 Drawing Sheets



PARTICULATE MATTER DELIVERY DEVICE

This application is a Continuation-In-Part of U.S. application Ser. Nos. 08/517,379 filed on Aug. 21, 1995, and 08/746,737 filed on Nov. 15, 1996, both of which are now abandoned, which are incorporated by reference. However, changes that included deletions from the aforementioned parent applications have necessitated a change in the inventive entity.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to delivery devices, and in particular to an improved apparatus for delivery of pressurized particulate matter against a surface or target to abrade, etch, erase, cut, penetrate, smooth, clean, polish and harden the surface or target.

BACKGROUND OF THE INVENTION

While a number of generalized applications for the present invention are mentioned above, one specific use to which the present invention is adapted is use by dentists and oral hygienists to clean teeth, particularly in preparation to adhere other materials to a tooth, such as a filling. The present invention is extremely well adapted to this application because it delivers a very effective cleaning capability, employing a particulate matter such as aluminum oxide, while at the same time having no effect on soft tissue such as the gums.

The major aspect of the present invention is a prefilled, sealed, and disposable fluidizing chamber and cannula assembly that avoids contamination and which has already been approved by the FDA for dental use. Earlier designs of pressurized particulate matter delivery devices have demonstrated there can be difficulty with clogging in the fluidizing chamber and/or the delivery tube. The present invention is partially directed to an improved internal structure of the fluidizing chamber which produces effective fluidization without clogging. It further provides for a custom designed double acting safety check valve to prevent backflow of particulate matter in the event of a drop in pneumatic pressure, and also to prevent excessive pressure from reaching the fluidizing chamber and delivery tube in the event of a pressure surge. Another feature of the invention includes a tapered nozzle and optionally bent particle delivery cannula. The custom designed double acting safety check valve aspect of the invention is designed to attach to the pneumatic pressure line of a dental office pedestal, operated by a foot pedal. This disposable fluidizing chamber and cannula assembly is extremely lightweight and is removably connected to the check valve.

Examples of prior known devices include that described in U.S. Pat. No. 4,941,298 to Fernwood, which discloses a rear-reservoir micro sandblaster. The Fernwood patent has numerous problems including costly to dispose, special training for set up and use, cannot deliver varying sizes of particles, contaminated after each use, must be completely sterilized after each use. Other known devices with similar problems are the Microetcher™ and the Handiblaster™ available from Mirage/Chameleon Dental Products, Inc.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide a particulate matter delivery device that includes an FDA approved prefilled, sealed, and disposable fluidizing chamber and cannula that avoids contamination. Prefilling, sealing, and disposability are key aspects to assurances that materials used in a patient's mouth are sanitary since the manufacturing facility has complete control over the sterility of the inventive device and the particulate matter with which it is charged in the manufacturing process.

Another important object of the present invention is to provide a particulate matter delivery device that includes an improved internal structure of the fluidizing chamber which produces effective fluidization without clogging.

One more important object of the present invention is to provide a particulate matter delivery device wherein the prefilled, sealed, and disposable fluidizing chamber and cannula assembly is removably connected to a custom designed double acting safety check valve, which acts to both prevent backflow to the pneumatic pressure line of a dentist's pedestal in the event of a pressure drop and also prevents pressure surges from reaching the fluidizing chamber, and the patient's mouth.

A related object of this invention is to provide a particulate matter delivery apparatus wherein the custom designed double acting safety check valve is removably attached to the pneumatic pressure line of a dental office pedestal, operated by a foot pedal.

A further object of this invention is to provide a device for delivery of a fluid particle stream using a cannula with a tapered nozzle to accelerate particle velocity.

An additional object of this invention is to provide a particulate matter delivery apparatus that is very lightweight to make it easy for a dentist or oral hygienist to use.

One more object of the invention is to provide an effective, safe, sanitary, FDA approved, easy to use dental cleaning device that requires essentially no capital investment by the dentist because it employs a pneumatic pressure line already found on a dentist's pedestal, uses a small lightweight check valve, and a small lightweight fluidizing chamber and cannula assembly that is disposable.

A preferred embodiment includes a fluidizing chamber for mixing fluid and particulate matter together by suspending the latter in the former, and a cannula tube having a particle accelerating tapered nozzle extending outside the fluidizing chamber, wherein the cannula tube delivers pressurized particulate matter from the fluidizing chamber to a surface or target at a high velocity.

The fluidizing chamber incorporates a simple yet extremely effective internal structure to accomplish the suspension of the particulate matter in the fluid, usually air. It is merely comprised of a discharge end of an inlet tube that is disposed below the intake end of the cannula or overlaps it. Both the inlet tube and cannula tube are preferably insert molded into the adjoining members of the fluidizing chamber structure. The effect is that the discharge of the inlet tube blows the particulate matter into the fluid above the intake end of the cannula, thereby suspending it therein, without clogging.

The members of the fluidizing chamber structure are comprised of a barrel, to which the cannula is preferably insert molded, and a barrel end cap, to which the inlet tube is preferably insert molded. The barrel end cap preferably has internal threads which rotate about and engage mateable threads on the top of the barrel of the fluidizing chamber. This structure allows, in an alternative embodiment, for the inventive to be recharged with particulate matter, but in the preferred embodiment, the fluidizing chamber is prefilled, sealed, and disposable. Sealing is accomplished by gluing or

otherwise preventing relative movement between the mating threads of the fluidizing chamber barrel and its barrel end cap after the fluidizing chamber has been charged with particulate matter. In the preferred embodiment, the manufacture, charging and sealing is all accomplished under sanitary conditions because the product is going to be used in a patient's mouth.

Another important feature of the preferred embodiment is the custom designed double acting safety check valve which is disposed between the prefilled, sealed, and disposable fluidizing chamber and the pneumatic pressure line of a dental office pedestal. This check valve primarily acts to prevent particulate matter from being drawn back in to the pneumatic pressure line in the event of a sudden drop in pressure, but will also will seal off the inlet tube into the fluidizing chamber in the event of a pressure surge such as may occur with a regulator failure or an unregulated run-away compressor.

One more feature of the invention is the use of a particle accelerating tapered nozzle at the discharge end of the cannula. This increases the velocity of the particles exiting from the cannula discharge orifice.

Further objects and advantages of this invention will be apparent from the following detailed description of a presently preferred embodiment which is illustrated schematically in the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a plan view of the improved particulate matter delivery device.

FIG. 2 is a partial cross-sectional view of the improved particulate matter delivery device of FIG. 1, showing the interior structure of the fluidizing chamber.

FIG. 3 is a broken cross sectional view of the top end of the barrel member of the fluidizing chamber showing the threaded end thereof.

FIG. 4 is a cross-sectional view of the barrel end cap member showing mating internal threads for attachment to corresponding threads on the top of the barrel.

FIG. 5 is a end view of the barrel end cap member of the fluidizing chamber showing eccentric position of the opening into which the inlet tube is placed to accommodate the fact that the discharge end of an inlet tube is disposed below the intake end of the cannula, which is concentric with the barrel. This Figure also shows the alternating barrel end cap flats and bulges of the locking hub end.

FIG. 6 is a broken view of the barrel showing an alternative embodiment of the cannula in a bent configuration that may be preferred by some users of the invention.

FIG. 7 is a side view of the barrel end cap of FIG. 5 showing an enlarged lateral dimension of the barrel end cap bulges of the locking hub end, used to interconnect with the check valve jaw lips.

FIG. 8 is a second alternative embodiment of the cannula with a flared intake end.

FIG. 9 is partial cross-sectional view of the double acting check valve showing the internal structure thereof.

FIG. 10 is an end view of the double acting check valve and jaw, which interconnects with the locking hub end of barrel end cap as seen in FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before explaining the disclosed embodiment of the present invention in detail it is to be understood that the invention is not limited in its application to the details of the particular arrangement shown since the invention is capable of other embodiments. Also, the terminology used herein is for the purpose of description and not of limitation.

FIG. 1 is a plan view of the improved particulate matter delivery device 2, having a fluidizing chamber 4, cannula 6, and double acting check valve 8. The fluidizing chamber 4 is comprised of barrel 10, and barrel end cap 12. Cannula 6 preferably includes a tapered nozzle 14 to accelerate particle velocity toward the target (not shown). Cannula 6 terminates, of course, with a discharge orifice 16.

FIG. 2 is a partial cross-sectional view of the improved particulate matter delivery device 2 of FIG. 1, showing the interior structure of the fluidizing chamber 4. Inlet tube 18 having discharge end 20 is shown overlapping the intake end 22 of cannula 6 to achieve the suspension of particulate matter in fluid such as air. Since the improved particulate matter delivery device 2, when in use, is usually held erect with the cannula 6 generally below the fluidizing chamber 4, the particulate matter 24 will generally then be resting at the cannula end of the barrel 10. It is for that reason that the above description refers to the internal structure of the fluidizing chamber as having a discharge end of an inlet tube that is disposed "below" the intake end of the cannula 6. Check valve jaws 30 and valve end cap 12 locking hub end 32 and barrel end cap bulges 78 interconnect. Cannula 6 is tightly held in barrel aperture 26. It is preferably insert molded thereat but also may be glued, press fitted or the like. Elsewhere, barrel end cap 12 is shown attached to barrel 10 at mateable threads 28. Also seen are double acting check valve 8, check valve jaws 30, which interconnect with locking hub end 32 at the top end of barrel end cap 12, gasket 34, guide pin 36 and pneumatic pressure line connector 38.

FIG. 3 is a broken cross sectional view of the top end 40 of the barrel member 10 of the fluidizing chamber 4 showing the mateable threads 28.

FIG. 4 is a cross-sectional view of the barrel end cap 12 showing mating internal threads 28, for attachment to corresponding threads on the top of the barrel, and barrel end cap aperture 42 into which is placed inlet tube 18 as seen in FIG. 2. Inlet tube 18 is placed in barrel end cap aperture 42 preferably during the molding process, i.e., is insert molded. Alternatively inlet tube 18 may be glued or press fitted into barrel end cap aperture 42. Finally, barrel end cap 12 includes barrel end cap flats 44 as more clearly seen in FIG. 5 and O-ring bearing internal surfaces 80.

FIG. 5 is a end view of the barrel end cap 12 of the fluidizing chamber 4 showing the eccentric position of the barrel end cap aperture 42, which is necessitated by the overlapping configuration of the inlet tube 18 and the barrel concentric cannula 6 as seen in FIG. 2. Also seen barrel end cap flats 44, barrel end cap bulges 78, rotation stops 46, and, in phantom, mateable threads 28.

FIG. 6 is a broken view of the barrel 10 showing an alternative embodiment of the cannula 6 in a bent configuration that may be preferred by some users of the invention.

FIG. 7 is a side view of the barrel end cap 12 of FIG. 5 showing an enlarged lateral dimension of the barrel end cap bulges 78 of the locking hub end 32. The barrel end cap bulges 78 interconnect and are tightly held as seen in FIG. 2 with the check valve jaws lips 74 disposed on the distal ends of check valve jaws 30.

FIG. 8 is a second alternative embodiment of the cannula 6 with a flared intake end 48.

FIG. 9 is partial cross-sectional view of the double acting check valve 8 in combination with check valve jaws 30,

guide pin 36 and pneumatic pressure line connector 38 showing the internal structure of check valve 8. Double acting check valve 8 is comprised of a check valve housing 50, check valve intake manifold 52, check valve intake port 54, resilient valve shuttle 56, check valve cylinder 58, check valve biasing means 60, floating biasing means retainer 62, check valve housing cap 64, check valve assembly retainer 66, check valve discharge port 68, O-ring channel 70, O-ring 72, check valve jaws 30 and check valve jaw lips 74. Resilient valve shuttle 56 may be made from rubber, and check valve biasing means 60 is preferably a coil spring.

In operation, air pressure entering check valve 8 passes through pneumatic pressure line connector 38 into check valve intake manifold 52. The pressure is exerted on resilient valve shuttle 56 which then overcomes the resistance of the check valve biasing means 60 and opens the check valve intake port 54. The fluid then passes through the check valve cylinder 58 to emerge through the check valve discharge port 68.

When the pressure in the pneumatic pressure line connector 38 drops check valve biasing means 60 causes the resilient valve shuttle 56 to close off the check valve intake port 54 thereby preventing particulate matter from backing up into the pneumatic pressure line connector 38. Similarly in the event of an excessive pressure surge, check valve biasing means 60 will be further compressed and the top surface of resilient valve shuttle 56 will be pressed against check valve discharge port 68 thereby preventing the pressure surge from reaching fluidizing chamber 4.

FIG. 10 is an end view of the double acting check valve 8 showing the top of the check valve housing 50, check valve discharge port 68, check valve jaws 30 and check valve jaw lips 74.

Interconnection of the check valve 8 with barrel end cap 12 is achieved by inserting barrel end cap 12 into the check valve jaws 30 with the barrel end cap 12 rotationally oriented so that the check valve jaws 30 are adjacent barrel end cap flats 44. When the barrel end cap 12 has been fully inserted, the barrel end cap 12 and check valve 8 are rotated with respect to each other until the check valve jaws reach the rotation stops 46 such that check valve jaw lips 74 pass over and fully engage with barrel end cap bulges 78. See FIG. 2. Rotation stops 46 also assure that rotation is done only in the right direction and stops after there is full engagement in a twist and lock configuration. Sealing is accomplished because O-ring 72 seen in FIG. 9 comes in contact with O-ring bearing internal surfaces 80 as seen in FIG. 4.

Of course the above procedure is simply reversed when disassembly is desired. Therefore, should the prefilled, sealed, and disposable fluidizing chamber and cannula assembly run out of particulate matter before a cleaning of a patient's teeth is completed, it takes only a few seconds to disconnect the discharged fluidizing chamber and cannula assembly, dispose of it, and reconnect a prefilled replacement onto the check valve.

While the above embodiments describe using particulate matter such as aluminum oxide in the chamber, other particles such as but not limited to sodium bicarbonate can be used. Further, the above embodiments can include a separate water line running through the interior chamber from a conventional outside waterline so that water under pressure can be sprayed onto teeth in a cleaning operation while sodium bicarbonate or aluminum oxide is also used in combination to clean the teeth.

Various materials used in the construction of the embodiments include but are not limited to plastic, stainless steel, Delrin™, and Teflon™.

Referring to all the above embodiments, various components can be sealingly attached to one another by means such as but not limited to ultrasonic welding, adhesive bonding, screwing and ratcheting, and sealing by solvent welding.

While the invention has been described, disclosed, illustrated and shown in various terms of certain embodiments or modifications which it has presumed in practice, the scope of the invention is not intended to be, nor should it be deemed to be, limited thereby and such other modifications or embodiments as may be suggested by the teachings herein are particularly reserved especially as they fall within the breadth and scope of the claims here appended and their equivalents.

What is claimed is:

1. In an improved pressurized particulate matter delivery apparatus having a fluidizing chamber for mixing fluid and particulate matter together wherein the improvement comprises:

an inlet tube connected to a pressurized fluid source and having a discharge end disposed within the fluidizing chamber;

a cannula having an intake end disposed within the fluidizing chamber and a discharge orifice disposed outside the fluidizing chamber;

wherein the inlet tube discharge end and cannula intake end overlap each other; and

a double acting check valve removably disposed between the pressurized fluid source and the fluidizing chamber to prevent backflow of particulate matter in the event of a drop in pressure from the pressurized fluid source and also to prevent a pressure surge from reaching the fluidizing chamber.

2. The apparatus of claim 1 which further comprises particulate matter disposed within the fluidizing chamber.

3. The apparatus of claim 1 in which the fluidizing chamber is comprised of a barrel and a barrel end cap, the barrel end cap having internal threads which rotate about and engage mateable threads on a top of the barrel.

4. The apparatus of claim 3 in which the inlet tube is fixedly attached to the barrel end cap and the cannula is fixedly attached to the barrel.

5. The apparatus of claim 3 in which the barrel and barrel end cap are formed of an injection moldable material, the inlet tube is insert molded into the barrel end cap and the cannula is insert molded into the barrel.

6. The apparatus of claim 1 which further comprises particulate matter disposed within the fluidizing chamber and wherein the fluidizing chamber, inlet tube, cannula and particulate matter are assembled in a manner that avoids contamination and sealed, except for inlet tube intake and cannula discharge orifice.

7. The apparatus of claim 1 in which the fluidizing chamber is comprised of a barrel and a barrel end cap, and where said apparatus further comprises:

check valve jaws connected to the check valve;

check valve jaws lips disposed on distal ends of the check valve jaws;

an O-ring groove surrounding the check valve inside the check valve jaws;

an O-ring disposed in the O-ring groove:

a locking hub end of the barrel end cap having alternating barrel end cap flats and barrel end cap bulges with rotation stops and having O-ring bearing internal surfaces;

such that the locking hub end of the barrel end cap can be inserted in between the check valve jaws along the

barrel end cap flats, and rotated with respect to the check valve to the rotation stops after full insertion resulting in full engagement of the check valve jaw lips with barrel end cap bulges such that the O-ring of the check valve presses against the O-ring bearing internal surfaces of the barrel end cap to seal the barrel end cap and check valve together.

8. The apparatus of claim 7 in which the check valve further comprises:

a housing;

an intake manifold disposed within the housing;

an intake port in fluid communication with the intake manifold;

a check valve cylinder disposed within the housing and in fluid communication with the intake port;

a discharge port;

a resilient valve shuttle movably disposed within the check valve cylinder, in fluid communication with the intake port and having both the capability to selectively close off the intake port and, alternatively to selectively close off the discharge port; and

a biasing means in physical communication with the resilient valve shuttle to both urge the resilient valve shuttle to close off the intake port in the absence of a predetermined pressure level pressing against resilient valve shuttle and, alternatively to yield to a pressure surge so that the resilient valve shuttle can close off the discharge port.

9. The apparatus of claim 1 in which the cannula includes a tapered nozzle.

10. The apparatus of claim 1 in which the cannula is bent.

11. The apparatus of claim 2 in which the particulate matter includes aluminum oxide.

12. The apparatus of claim 2 in which the particulate matter includes sodium bicarbonate.

13. The apparatus of claim 3 in which particulate matter disposed within the fluidizing chamber may be exhausted in use, and in which the fluidizing chamber may be recharged by the user disengaging the barrel and a barrel end cap employing the barrel end cap internal threads which counter-rotate about and disengage mateable threads on a top of the barrel, adding particulate matter into the barrel, and reingaging the internal threads of the barrel end cap with the mateable thread on the top of the barrel.

* * * * *

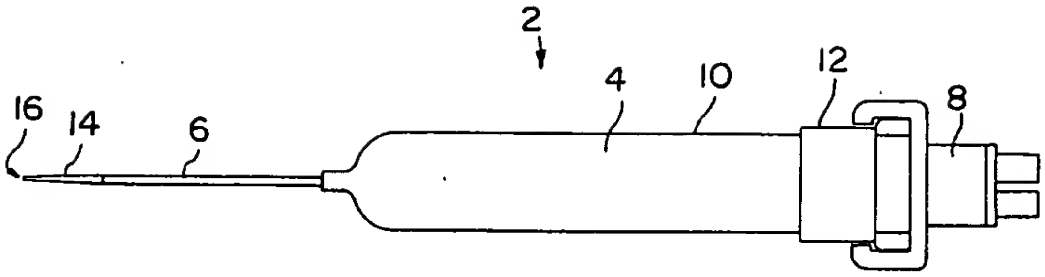

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FIG. 1

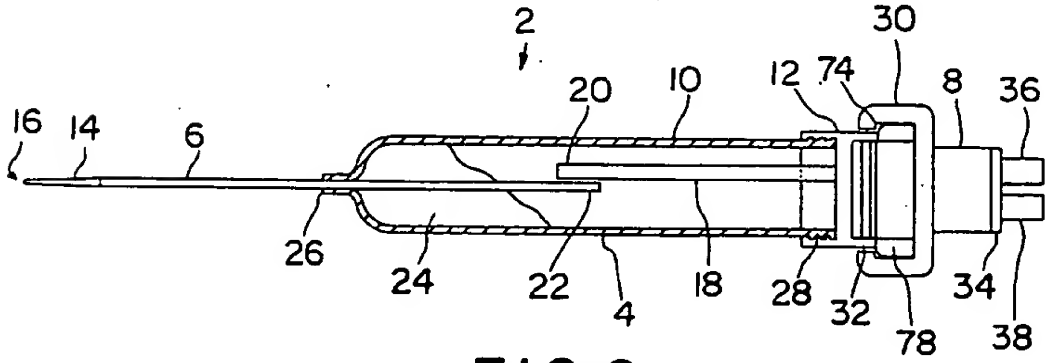
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FIG. 2

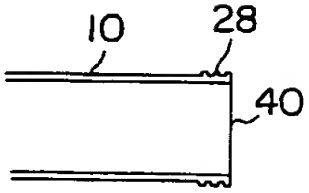


FIG. 3

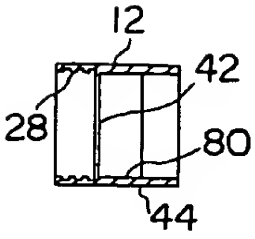


FIG. 4

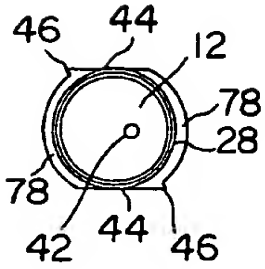


FIG. 5

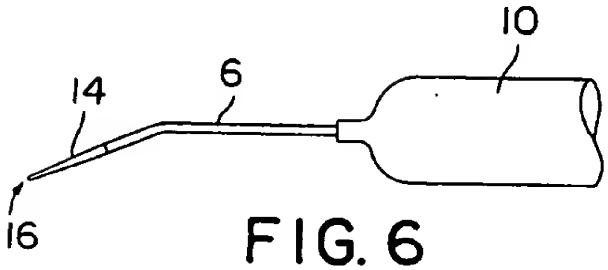


FIG. 6

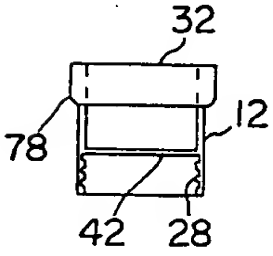


FIG. 7

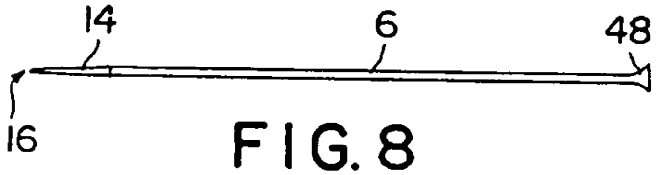


FIG. 8

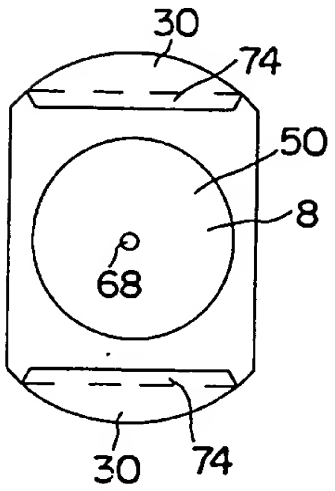


FIG. 10

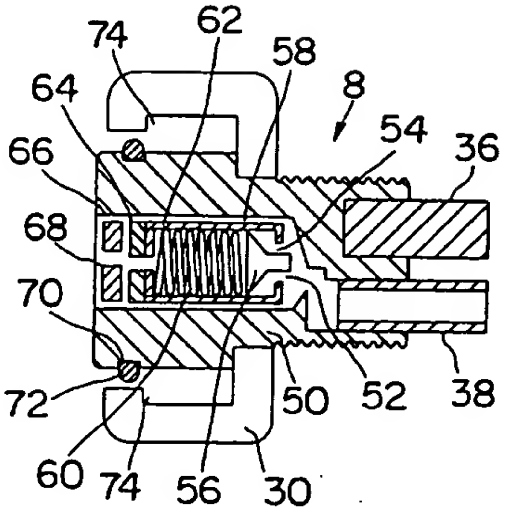


FIG. 9

Exhibit F

Submission of New Application with Missing Parts. Schur, et al. (Alleged Infringing party) filed a submission for a new Utility Patent Application (Application 08/746,737, filed on November 15, 1996) with missing parts.

Patent
#11034-CIP
Appl. # 08/746,737

IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE

Applicants: Reuben Hertz, Henry B. Schur and John E. Trafton

For: PARTICULATE MATTER DELIVERY DEVICE

Oltman, Flynn & Kubler #11034-CIP

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

SUBMISSION OF NEW APPLICATION WITH MISSING PARTS

Sir:

Submitted herewith is a patent application entitled PARTICULATE MATTER DELIVERY DEVICE. The three joint inventors are Reuben Hertz, Henry B. Schur and John E. Trafton.

We are submitting executed declaration and verified statement papers for Henry B. Schur and John E. Trafton and an unexecuted copy of the declaration and verified statement of Reuben Hertz.

The completed declaration and verified statement of Reuben Hertz will be furnished later.

#11034-CIP

Respectfully submitted,

John H. Oltman
Oltman, Flynn and Kubler
415 Galleria Professional Building
915 Middle River Drive
Fort Lauderdale, FL 33304-3585
(954) 563-4814

Dated 11/15/96

Exhibit G

USPTO Notice to File Missing Parts of Application

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
08/746,737	11/15/96	HERTZ	R 11034-CIP

0272/1226

OLTMAN FLYNN AND KUBLER
915 MIDDLE RIVER DRIVE
415 GALLERIA PROFESSIONAL BUILDING
FORT LAUDERDALE FL 33304-3585

3203

DATE MAILED: 12/26/96

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. However, the items indicated below are missing. The required items and fees identified below must be timely submitted ALONG WITH THE PAYMENT OF A SURCHARGE for items 1 and 3-6 only of $ 65 for a ☐ large entity ☑ small entity in compliance with 37 CFR 1.27. The surcharge is set forth in 37 CFR 1.16(e). Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required above to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☐ large entity ☑ small entity (verified statement filed), is $ 65.

☐ 1. The statutory basic filing fee is:
- ☐ missing.
- ☐ insufficient.

Applicant must submit $ _____ to complete the basic filing fee and/or file a verified small entity statement claiming such status (37 CFR 1.27).

☐ 2. Additional claim fees of $ _____, including any multiple dependent claim fees, are required.
Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☐ 3. The oath or declaration:
- ☐ is missing.
- ☐ does not cover the newly submitted items.
- ☐ does not identify the application to which it applies.
- ☐ does not include the city and state or foreign country of applicant's residence.

An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the application by the above Application Number and Filing Date is required.

☐ 4. The signature(s) to the oath or declaration is/are:
- ☐ missing.
- ☐ by a person other than inventor or person qualified under 37 CFR 1.42, 1.43, or 1.47.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☑ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:
Reuben Hertz

An oath or declaration listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. A $ _____ processing fee is required since your check was returned without payment (37 CFR 1.21(m)).

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application does not comply with the Sequence Rules.
See attached "Notice to Comply with Sequence Rules 37 CFR 1.821-1.825."

☐ 9. OTHER:

Direct the response and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the response.

D. Durham

Customer Service Center
Initial Patent Examination Division (703) 308-1202

Exhibit H

Hert z to Oltman Correspondence Dated November 5, 1996.

REUBEN HERTZ, D.D.S.

2717 E. Oakland Park Blvd.
Ft. Lauderdale, FL 33306

(305) 566-6200

November 5, 1996

John H. Oltman, Esq.
LAW OFFICES OF OLTMAN AND FLYNN
915 Middle River Drive
Fort Lauderdale, FL 33304-3585

RE: Patent Application Number : 08/517,379
Your File Number : 10566

Dear Mr. Oltman:

Regarding our conversation on November 4, 1996, this is to notify you that I wish to be advised of any and all matters related to my pending patent. No action is to be taken without both my verbal and written consent.

Thank you for your prompt attention to this matter.

Very truly yours,

Reuben Hertz, D.D.S.

RH:sc

cc KIS Technologies, Inc.
Stephen F. Goldenberg, Esquire

Exhibit I

Oltman to Trafton / Schur / Simplex
Medial Systems, Inc. Correspondence
Dated December 6, 1996

LAW OFFICES OF
OLTMAN, FLYNN & KUBLER
REGISTERED PATENT ATTORNEYS
415 GALLERIA PROFESSIONAL BUILDING
915 MIDDLE RIVER DRIVE
FORT LAUDERDALE, FLORIDA 33304-3585
TELEPHONE (954) 563-4814
BROWARD FAX (954) 563-1226
DADE FAX (305) 947-3888

JOHN H. OLTMAN
FRANK L. KUBLER
WILLIAM J. FLYNN - INACTIVE MEMBER FLORIDA BAR

ADAM A. JORGENSEN - CONSULTANT
REG. PATENT AGENT AND NOT
MEMBER OF FLORIDA BAR

OF COUNSEL:
BRIAN S. STEINBERGER

BOCA RATON OFFICE:
THE PLAZA • SUITE 801
5355 TOWN CENTER ROAD - 33486
(561) 391-4900

MIAMI OFFICE:
NATIONSBANK TOWER • SUITE 2750
100 SOUTHEAST 2ND STREET - 33131
(305) 947-3888

December 6, 1996

John E. Trafton, Ph.D.
Mr. Henry B. Schur
Simplex Medical Systems, Inc.
430 Ansin Boulevard, Suite G
Hallandale, FL 33009

RE: Dr. Reuben Hertz and
Simplex Medical Systems, Inc.
Our File: #11034-CIP

Dear Jack and Henry:

Dr. Hertz is upset that the continuation-in-part application was filed and he no longer wants me to represent you. He believes he is the inventor and there is now a conflict of interest.

I have to agree and, therefore, Frank Kubler and I hereby withdraw as attorneys for Simplex Medical Systems, Inc., Analyte Diagnostics, Inc., and you individually. I will send copies of your files to your new attorney when you let me know who he is.

I am very sorry about having to withdraw, and I bear no ill will.

Very truly yours,

OLTMAN FLYNN & KUBLER

John H. Oltman

JHO/nm

cc: Dr. Reuben Hertz

Exhibit J

Oltman to Hertz Correspondence Dated December 10, 1996

LAW OFFICES OF
OLTMAN, FLYNN & KUBLER
REGISTERED PATENT ATTORNEYS
415 GALLERIA PROFESSIONAL BUILDING
915 MIDDLE RIVER DRIVE
FORT LAUDERDALE, FLORIDA 33304-3585
TELEPHONE (954) 563-4814
BROWARD FAX (954) 563-1226
DADE FAX (305) 947-3888

JOHN H. OLTMAN
FRANK L. KUBLER
WILLIAM J. FLYNN - INACTIVE MEMBER FLORIDA BAR

ADAM A. JORGENSEN - CONSULTANT
REG. PATENT AGENT AND NOT
MEMBER OF FLORIDA BAR

OF COUNSEL:
BRIAN S. STEINBERGER

BOCA RATON OFFICE:
THE PLAZA • SUITE 801
5355 TOWN CENTER ROAD - 33486
(561) 391-4900

MIAMI OFFICE:
NATIONSBANK TOWER • SUITE 2750
100 SOUTHEAST 2ND STREET - 33131
(305) 947-3888

December 10, 1996

Reuben Hertz, D.D.S.
2717 E. Oakland Park Boulevard
Fort Lauderdale, FL 33306

RE: A DISPOSABLE DEVICE UTILIZING GAS FOR THE DELIVERY OF PARTICULATE MATERIAL
Our File: #11034-CIP

Dear Dr. Hertz:

You asked me to send you a letter concerning your original patent application and its effect on the CIP patent application filed recently in your name and also the names of Dr. John Trafton and Henry Schur. These comments do not take into account your agreement with Simplex, which I do not have.

The original application is still intact and remains solely in your name. It has not been changed and, in fact, we recently received the first Office Action in this patent application and you are reviewing it now.

This original application covers the invention broadly. If we are able to get broad claims allowed in this original application, it will dominate the narrower invention of the CIP application. If such dominating claims are allowed in the original application, a device produced in accordance with the CIP application would infringe the original patent.

Also, since you are a joint inventor on the CIP application, you are entitled to use that subject matter without accounting to the other inventors. The other inventors would not be able to use it if dominating claims are allowed in the original patent because they would be infringing the original patent.

Sincerely yours,

OLTMAN FLYNN & KUBLER

John H. Oltman

JHO/nm

Exhibit K

Goldenberg to Trafton / Simplex Medical Systems, Inc. Correspondence Dated December 19, 1996

Law Offices of

Goldenberg & Goldenberg, P. A.

ATTORNEYS AND COUNSELLORS AT LAW

RENEE GOLDENBERG
BOARD CERTIFIED MARITAL & FAMILY LAWYER

STEPHEN F. GOLDENBERG
BOARD CERTIFIED TAX LAWYER
MEMBER OF NEW YORK BAR

SHARON LYN CREWSS
LEGAL ASSISTANT

SUITE 2626
ONE FINANCIAL PLAZA
Fort Lauderdale, Florida 33394
BROWARD (954) 523-2626

FILE NO. 5141.01

December 19, 1996

VIA FACSIMILE TRANSMISSION & U.S. MAIL

Mr. Jack E. Trafton, President
Simplex Medical Systems, Inc.
430 Ansin Boulevard
Suite G
Hallandale, FL 33009

Re: Simplex/KIS Joint Development and Marketing Agreement

Dear Mr. Trafton:

Our client has had the opportunity to consider your letter dated December 3, 1996 with the counter proposal to our letter to you dated November 26, 1996. Unfortunately, it appears that our positions are too far apart to warrant further negotiations. Therefore, the Agreement between KIS Technologies, Inc. and Simplex Medical Systems, Inc. dated December 20, 1995 will terminate in accordance with its terms and provisions on December 20, 1996.

It is expected that both our client and you will strictly adhere to the terms and provisions of the Agreement with regard to proprietary and confidential information which was disclosed to the other party solely as a result of the relationship under the expiring Joint Development and Marketing Agreement dated December 20, 1995. Any breach or anticipated breach of the proprietary information and confidentiality provisions of the Agreement will be strictly enforced. Similarly, any attempt to infringe upon Dr. Hertz' patent will also not be tolerated.

With regard to the action that Simplex filed against KIS Technologies, Inc., our client has authorized us to advise you that its introduction to Johnson & Johnson was through your company, that it has not in any way contacted Johnson & Johnson and will not do so in the future.

We are sorry that the respective parties were unable to successfully negotiate a new agreement and hope that future enforcement action by either party will not be necessary.

Sincerely yours,

STEPHEN F. GOLDENBERG
For the Firm

SFG/arg

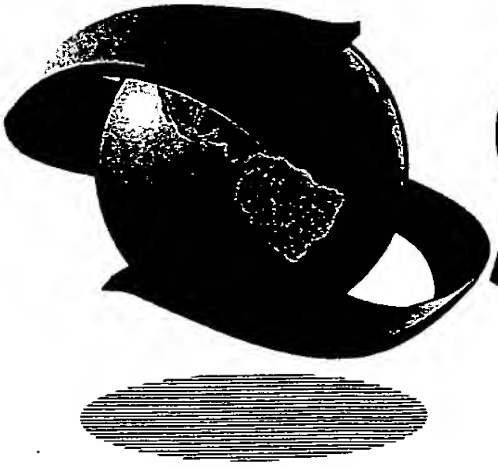
cc: Reuben Hertz, D.D.S.
Barry B. Groman
Len Maniscalco

Exhibit L

Copy of SMLX Technologies Sales Brochure

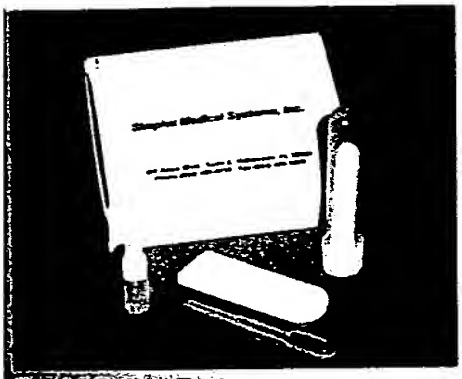
A

Bio-engineering, Problem Solving Company



SMLX

TECHNOLOGIES, INC.



Rapid Saliva Tests

What is SMLX Technologies, Inc.?

SMLX is a public company that develops technological solutions for the medical, dental and other industries. In May 1998, SMLX, formerly known as Simplex Medical Systems, began its evolution from focusing on research and development to functioning as an operating company.

Bringing Our Products to the Marketplace

SMLX uses various strategies to bring the technologies it develops to the marketplace.

Airbrasion

Airbrasion technology has multiple applications and SMLX intends to market it in three distinct markets:

- **Dental:**The strategy used for the dental market was to form a joint venture with a manufacturer and license a distributor of dental supplies to sell the product in the US and Europe. SMLX will use other distributors in territories not covered by the principal distributor.
- **Industrial:** For the industrial and home crafts markets, SMLX is in dicussions with the oldest practitioner of airbrasion technology in the United States to manufacture and sell the SMLX airbrasion technology in the United States. Strategies for distribution in other parts of the world will depend on the capabilities of yet to be selected joint venture partners.
- **Commercial:** The strategy that will be used to penetrate the home market will depend upon the capabilities of the partner(s) chosen.

Rapid Saliva Test

SMLX will manufacture the Rapid Saliva Test because of the need to maintain quality control standards coupled with the need to closely guard the technology. SMLX markets the tests in foreign countries through exclusive country distributors.

Microtiter

To bring the company's microtiter technology (used in medical diagnostics, forensic medicine, DNA research and other scientific fields for the analysis of small quantities of chemical or biological components) to the world market, SMLX licensed both the manufacturing and marketing to a 270 year old English company that is the world leader in separation technology. While this product is not expected to produce revenues as large as the above two products, it is an example of the diversity of SMLX's capabilities.

Creating Better Solutions

While SMLX is only three years old, our two chief scientists have worked together over the past 30 years in a variety of industries, accumulating in-depth knowledge in many diverse disciplines. They have shown an ability to provide solutions to problems where the existing solution is inadequate as well as provide solutions to problems that here-to-fore have not had solutions. SMLX scientists attribute their ability to achieve elegant solutions to their being "too dumb" to know something can't be done, coupled with their unique ability to think "outside of the box."

Rapid Saliva Tests

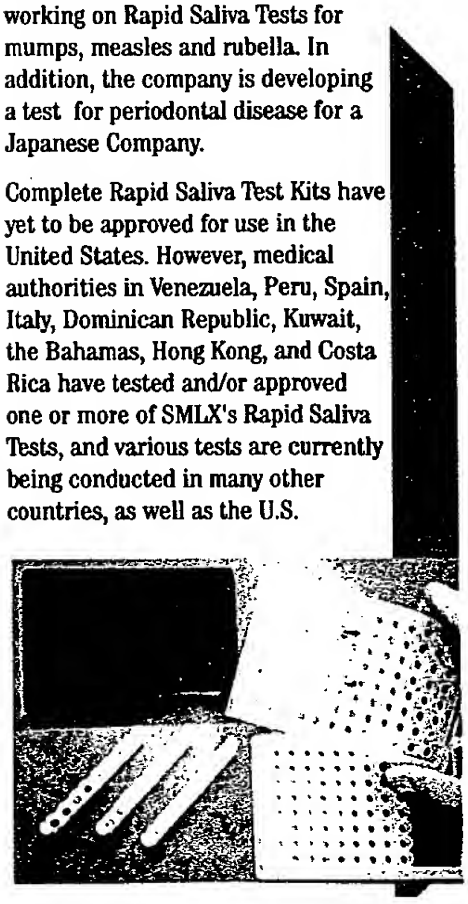
In order to test newborn children of cocaine-positive mothers, hospital staff members at Jackson Memorial Hospital (Miami, FL) used urine for the tests rather than blood. Naturally, this is not a pleasant task. A nurse, who had the job of collecting urine, asked a SMLX scientist if he could develop an acceptable test that would not

The better solution developed by SMLX was a Rapid Saliva Test for cocaine. It features a patent-pending, saliva collection system, for on-the-spot testing of a saliva sample. The SMLX Saliva Collector automatically ensures the appropriate amount of saliva is collected, eliminating the need for intricate measuring.

Saliva is comparable and sometimes preferable to other biological fluids (such as blood, urine or fecal matter) for constituent analysis. Collecting saliva is non-invasive and eliminates having to be stuck with a needle. It is being adopted by more and more testing authorities as the test of choice because the test is inexpensive and can be analyzed quickly and on-the-spot by anyone with minimal training.

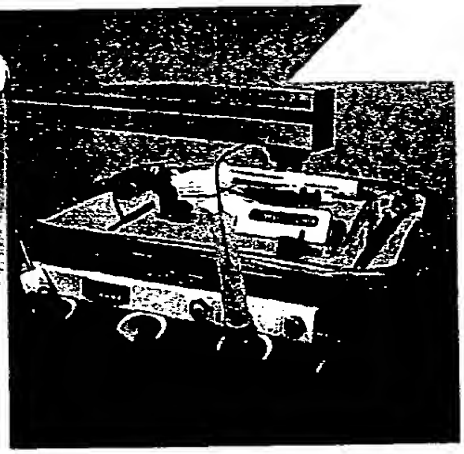
Using the same basic methodology and mechanisms, SMLX has also developed Rapid Saliva Tests for HIV hepatitis, CHAGAS, PSA (Prostate Cancer) and H-pylori (ulcers) as well as drugs of abuse. SMLX has also developed a test for EIA (equine infectious anemia), using blood instead of saliva. SMLX also is working on Rapid Saliva Tests for mumps, measles and rubella. In addition, the company is developing a test for periodontal disease for a Japanese Company.

Complete Rapid Saliva Test Kits have yet to be approved for use in the United States. However, medical authorities in Venezuela, Peru, Spain, Italy, Dominican Republic, Kuwait, the Bahamas, Hong Kong, and Costa Rica have tested and/or approved one or more of SMLX's Rapid Saliva Tests, and various tests are currently being conducted in many other countries, as well as the U.S.



Airbrasion Technology

A dentist and friend of an SMLX scientist told him that, while airabrasion is a great technology for the dental industry, the existing abrasion machines cost thousands of dollars, are bulky, have to be cleaned and sterilized after every use and require regular maintenance. He asked our scientist if he could invent a less expensive product that would be easier to use.



Airbrator

In less than a year, SMLX personnel invented a disposable dental air abrasion unit (named the Airbrator) that could be attached to the normal dental equipment found in every dentist's office and would retail for less than $10. The Airbrator, does not make a noise or generate heat as does a regular dentist drill. It uses aluminum oxide as an abrading material. Aluminum oxide has the unusual property of penetrating hard surfaces, such as tooth enamel, but has no effect on soft tissue. There is no need for anesthesia, thus eliminating being stuck with a needle, if the dental job can be done with an Airbrator. This product is ideal for pediatric dentistry. A child will find that going to a dentist that uses an Airbrator is not a frightening experience.

During the same one year period, SMLX also applied for a patent on the Airbrator, obtained FDA approval to use the product for abrading, etching and polishing teeth and entered into a joint venture with a manufacturer to produce the product and licensed a dental company to market the product. Verbal approval has been received from the FDA that the Airbrator has passed all technical tests for use in cavity preparation. Full approval is expected to be granted as soon as the manufacturing site is inspected by the FDA.

Creating New Solutions

SMLX scientists have developed a flavor enhancing technology that can be used in two ways. It can either make the taste of a product such as gum or chocolate last longer, or it can be used to reduce the amount of taste ingredient used in the product (often the costly ingredient) to maintain the same taste life.

SMLX is working with a pharmaceutical company in Australia to mask the unappealing taste of one of its medicines. The technology can also be used to give the aluminum oxide used in the Airbrator a bubble gum flavor when being used on children and a mint or other flavor for adults.

It is the use of the SMLX flavor enhancing technology in the advertising medium that has exciting possibilities. Fragrances of solids and liquids can be duplicated and transmitted via the printed page ala "Scent Strips™." A SMLX scientist, who worked on the "Scent Strips™ technology, has invented a technology that can duplicate and transmit the tastes of manufactured foods and liquids via a sanitized page printed with a realistic colored picture of the food or drink. Readers will not only be able to see what the new product looks like, but also can taste it.

An offshoot of this technology would allow certain medicines to be printed instead of manufactured, which would materially reduce costs. A major US pharmaceutical company has expressed an interest in this technology.

SMLX: Armed with Solutions

SMLX has gained a reputation for providing unique solutions to problems. We are currently working on projects that have been brought to us from Australia, Asia and Europe. Additionally, because of past experience of SMLX scientists SMLX is interested in licensing technologies in the following areas:

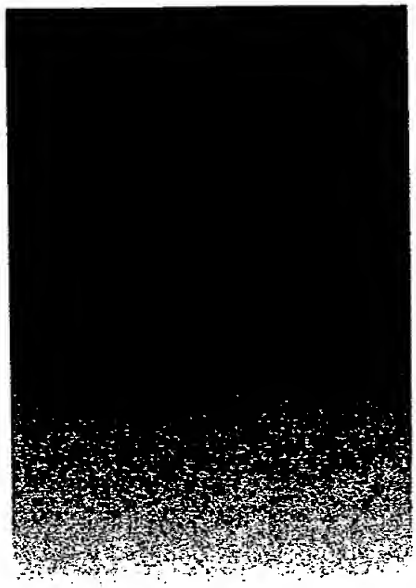
- Transdermal delivery of certain medications currently administered via needle.
- Material reduction of fruit and vegetable losses during transportation.
- Antimicrobial technology that will permanently repel germs. This technology can be integrated into materials used in food counters, false teeth, toothbrushes or areas that are best kept clinically clean.
- Technology that can be applied to marine surfaces to prevent fouling.
- Technology that will remove barnacles from ship hulls.
- Technology that can be applied to walls, roofs and other surfaces that will prevent mildew from forming.
- Technology that can eliminate unfavorable diesel engine emissions.

The company is in various stages of research and development of the above technologies, and there is no assurance that these technologies will result in marketable products.

SMLX Past, Present and Future...

SMLX has products in the marketplace, and second generation improvements for current products already developed. It is also developing new products. SMLX is involved in solving problems being brought to us and has a stable of solutions to problems that can be undertaken when we find time, financing and joint venture partners.

Airbrator in use



SMLX
TECHNOLOGIES, INC.
376 Ansin Blvd.
Hallandale, FL 33009
954-455-0110
Fax: 954-455-9008
email: inquiry @smlx.com
web: www.smlx.com

Exhibit M

Copy of BioStar Sales Brochure

EDGE DENTAL, INC.
PO BOX 4332
TRAVERSE CITY, MI 49685-4332

Bulk Rate
U.S. Postage
PAID
Grand Rapids,
Permit #657

DR REUBEN HERTZ
2318 SEA ISLAND DR
FORT LAUDERDALE FL 33301-1575

BioStar™ Airbrator®

— FOR PROFESSIONAL USE ONLY —

Order Form

Name/Company _____ DDS / DMD

Address _____

City _____ State _____ Zip _____

Phone ( ) _____ Ordered by _____

Specialty _____

Item	Qty.	Price Each	Qty.	Price Per Box of 10	Amount
☐ High Performance Airbrators®	____	$14.95	____	$99.95	_____
☐ Medium Performance Airbrators®	____	$14.95	____	$99.95	_____
☐ Light Performance Airbrators®	____	$14.95	____	$99.95	_____
☐ Airbrator® Starter Kit	____	$84.00			_____
☐ Connector	____	$35.00			_____
☐ Tip Bending Tool	____	$5.00			_____
				Sub-Total	_____
		MI Residents add 6% Sales Tax			_____
				Shipping & Handling	Call
				Total	_____

☐ Bill Me

☐ Payment Enclosed

Make checks payable to:
Edge Dental, Inc.

Or order by phone:
1-800-873-6070
Fax 231-922-2274

Call today for a free catalog of products fro Edge Dental including:

- Diack/Vac — Chemical Indicators
- Sterilization Pouches
- Palatal Anesthesia Device
- Edgemate Sharpening Stones
- Disposable Chairside Sharpening Guide
- Hartzell Dental Instruments
- NorthBay/Bioscience Sterilizer Monitoring Service

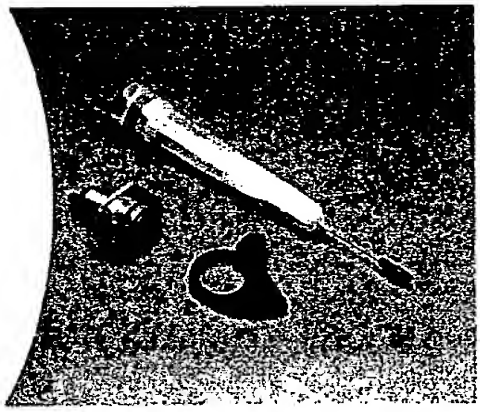
1-800-873-6070

CLIP & SEND

AIRBRATORS® $14.95 each
Box of 10 Airbrators®: $99.95 per box
Tip Bending Tool: $5.00
Connector: $35.00

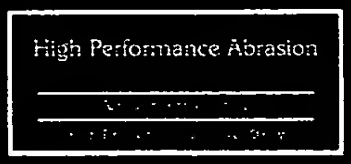
Pricing

STARTER KIT $84.00 includes:
3 High Performance Airbrators®
1 Medium Performance Airbrator®
2 Light Performance Airbrators ®
1 Airbrator® Connector, and Instructions

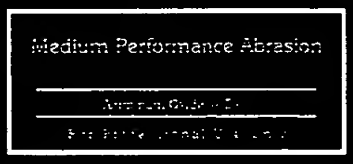


The BioStar™ Airbrator is a single-use air abrasion handpiece that connects to your existing air line. It is a direct alternative to traditional, expensive, self-contained air abrasion units.

The Airbrators® come in three grades:



Use High Performance for comprehensive preparation and rapid penetration of target area



Use Medium Performance for precise abrasion and moderate penetration of target area. Effective in preparation of surfaces to be bonded

Use Light Performance for removing stains, cleaning and polishing target area

BioStar™ Airbrator

- Patented delivery system maintains constant particle flow, increasing operator control and minimizing powder overspray.
- Disposable handpiece reduces the threat of cross-contamination.
- Quick connect to existing dental unit high speed air line minimizes setup and cleanup time for dental assistants.
- Handpiece design requires no maintenance, no sterilization, no filling with messy powders, no expensive tip replacements, and doesn't require additional floor or countertop space.
- FDA-registered.

Air Abrasion Technology

- Conserves the maximum amount of healthy tooth structure.
- Saves time. Doctors report that less than 10% of their patients need anesthetic when air abrasion is used, saving injection and numbing time.
- Allows for multiple quadrant treatment in one visit.
- Quiet. No vibration, and no high-pitched noise.
- Less sensitivity to your patients.
- Patients love it! Procedures take less time. Patients experience less postoperative sensitivity.

Connector screws onto existing air line.

Q What are the advantages of the Airbrator® over traditional air abrasion units?

A The major advantage is cost. Traditional air abrasion units can cost up to $20,000! Airbrators® cost as little as $9.95 each, with these added advantages:

- No maintenance, no refilling, no autoclaving;
- No dragging heavy equipment from operatory to operatory;
- Fits standard handpiece connectors; and
- Setup is simple.

Q Will I be able to use my new Airbrators immediately?

A Yes, however, as with other new dental equipment, some practice and study of technique is strongly recommended. We recommend particular emphasis on case selection.

For what procedures should I use the Airbrator®?

Applications include class I, III, IV & V preparations, removing composites, porcelain and amalgam stains and P.R.R. (Preventive Resin Restoration) preparations.

Does the Airbrator® require any special care?

No. Simply remove from its pouch, connect to your air line, use, and dispose. No need to autoclave. No need to refill.

Use of a rubber dam is recommended.

Q Will the Airbrator® save me time?

A The major benefit of air abrasion is the lack of sensitivity to the patient and less discomfort for the patient. The reduced need for anesthesia, multiple quadrant procedures and minimal set up time all add up to a more productive, time saving, and higher quality experience for doctor and patient.

Tip bender reduces crimping.

Q How can I minimize overspray?

A As with traditional air abrasion units, for intraoral applications you should use high speed suction. For patient protection, a rubber dam or moistened gauze pads surrounding the work area and protective eyewear should be used. For extra-oral applications, use a dust cabinet. Although overspray is a common complaint with all types of air abrasion, practitioners commonly state that overspray can be greatly diminished with experience.

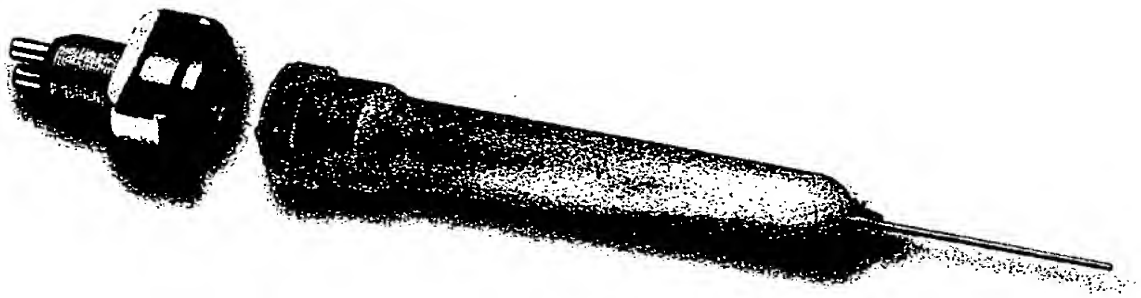
Q I'm not sold yet. Why else should I give the Airbrator® a try?

A Wouldn't your patients like to know that you take a less invasive, more preventive approach to dentistry, treating early stage caries rapidly and comfortably rather than watching and waiting? Build your practice with micro-dentistry, a conservative, aesthetic approach.

Exhibit N

Copy of NonINvasiveMeds.com, Inc. Sales Brochure

NonInvasiveMeds.com™
Disposable Air Abrasion Dental Hand Piece



- **Simple** - Connects to your *EXISTING* air line!
- **Disposable** - *NO* autoclaving of dental equipment!
- **Cost-Effective** - *NO* additional equipment required!
- **Painless** - *REDUCES* the need for anesthesia!
- **Time Saving** - *REDUCES* patient time in the chair!
- **Patient Satisfaction** - *"FEEL GOOD"* dentistry!
- **"FDA-REGISTERED" and "ISO / CE CERTIFIED"!**

NonInvasiveMeds.com, Inc.

NonInvasiveMeds.com™, Inc.®

LISA D. KIEFER
Regional Sales Consultant
2495 NW 39th Street, Boca Raton, FL 33431
Tel: 561-702-5433
E-mail: info@noninvasivemeds.com

U.S. Corporate Offices:

NonInvasiveMeds.com™, Inc.®
2495 NW 39th Street
Boca Raton, FL 33431

Telephone: 561-483-1402
Telefax: 561-483-1402
E-mail: info@noninvasivemeds.com
URL: www.noninvasivemeds.com

Getting Started

- ***TURN OFF*** **dental water line *prior* to installation.**
- ***CONNECT*** **the Airbrator® to a standard dental unit air line.**
  ADJUST **air pressure to between (60 - 90 psi) ONLY.**
- ***ATTACH*** **the Airbrator® Connector to your dental air line. *See Figure 1.***
- ***TIGHTEN*** **dental air line fitting until snug against the gasket of the connector.**
- ***ACTIVATE*** **the hand piece air with the water turned off for 5 seconds before attaching the Airbrator®. This prevents water from entering the powder chamber.**
- ***REMOVE*** **Airbrator from package, remove Airbrator® End Cap. *See Figure 2.***
- ***LINE UP AND SEAT*** **the Airbrator® hand piece in Connector.**
- ***TURN AIRBRATOR® CLOCKWISE*** **until it locks in place. *See Figure 3.***
- ***REMOVE*** **the Airbrator® Tip Cap. *See Figure 4.***

Caution: This is a disposable device. Discard after single patient use. Do not attempt to sterilize, refill or reuse. Federal law restricts this device to sale to, or on the order of, a dentist.

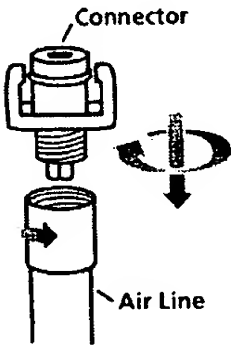


Fig. 1

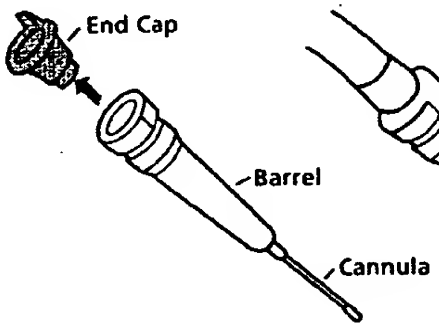


Fig. 2

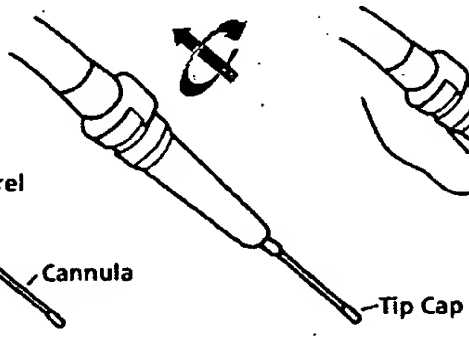


Fig. 3

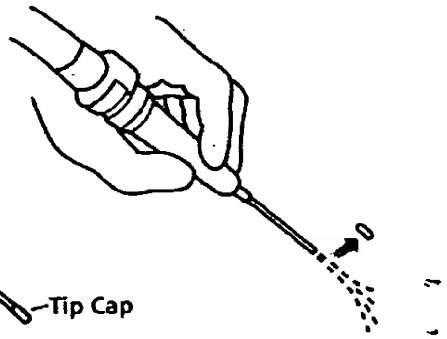


Fig. 4

Safety First

- **ALWAYS CONFIRM** that the Airbrator® is properly and securely locked into position on Connector before use.

- **DO NOT USE** oxygen or other flammable or toxic gases as propellant.

- **ALWAYS POINT TIP AWAY** from operator's and patient's face and eyes.

- **PROTECT EYES** and avoid powder accumulation on prescription lenses by use of safety glasses. Rinse, do not rub, powder off prescription glass and other polished surfaces.

- **USE HIGH SPEED SUCTION** to reduce inhalation of extra-oral airborne powder. Airborne dust particles can cause eye, nose, and throat irritation.

- **USE A RUBBER DAM,** whenever possible, **TO PROTECT ADJACENT TEETH** and to prevent the patient from swallowing powder. If this is not possible for clinical reasons, surround the area to be treated with gause pads moistened with water.

- **AFTER THE PROCEDURE IS COMPLETED** or abrasive material is fully exhausted; remove the **Noninvasivemeds.com™ Airbrator** by turning it counter clockwise and pulling off the Connector.

- **AFTER USE, HANDLE AND DISPOSE OF THIS DEVICE** and the materials that contacted it, including the Airbrator® Connector, as potential biohazards. These materials should be handled at the BIOSAFETY LEVEL 2 as recommended for any potentially infectious serum or blood specimen in the Centers for Disease Control/ National Institutes of Health Manual "BioSafety in Microbiological Laboratories," 1984.

- **EXTRA-ORAL AIR ABRASION** should be done inside a dust cabinet. Abrasive particles can damage nearby machinery and optical instruments, including eyeglasses and mirrors.

- **EXCESSIVE AIR ABRADING** will erode most surfaces. Experiment on typodonts, pennies, stainless steel, extracted teeth and glass. These surfaces will simulate both precious and non-precious alloys and porcelain. A film such as dryfoil may be used as a shield. **NOTE: Air abrasion is not FDA approved for amalgam removal.**

The NonInvasiveMeds.com™ Dental Airbrator®:

- ***First*** single-use, ***disposable*** Air Abrasion dental hand piece
- ***Designed*** for both ***intra-oral*** and ***extra-oral*** applications
- ***User-friendly,*** simply connects to your ***existing*** air line using (60-90 psi)
- ***Direct*** alternative to traditional/expensive air abrasion units

Three (3) Performance Levels of Dental Airbrators®

HIGH PERFORMANCE ABRASION Aluminium Oxide - 5.0g For Professional Use Only	■ **PREPARES** tooth surfaces for sealants and composites ■ **PREPARES** tooth surfaces for orthodontic bracket bonding ■ **PREPARES** tooth surfaces for bonded bridges ■ **REMOVES** cement from temporary/permanent restorations ■ **PREPARES** targeted cavity areas for fillings
MEDIUM PERFORMANCE ABRASION **Aluminium Oxide - 5.0g** **For Professional Use Only**	■ **PREPARES** tooth surfaces for adhesive bonding ■ **PREPARES** ceramic inlays, crowns, and bridges ■ **PREPARES** composite, acrylic, ceramic, and metallic surfaces for bonding, cementation and repair ■ **REMOVES** cement from temporary/permanent restorations
LIGHT PERFORMANCE ABRASION **Sodium Bicarbonate - 5.0g** **For Professional Use Only**	■ **REMOVES** stains from tooth surfaces ■ **REMOVES** surface deposits from teeth ■ **POLISHES** target areas

Air Abrasion Technology:

- ***Conserves*** the ***maximum*** amount of ***healthy*** tooth structure and surface
- ***Results*** in a surface that is ***suitable*** for all bonding procedures
- ***Saves*** time, dental practitioners are able to see ***more*** patients each day
- ***Promotes*** a less invasive, ***more*** preventive approach to dentistry
- ***Benefits*** patients with ***less*** postoperative sensitivity, ***...happier*** patients!

Exhibit O

Copy of Purchase Sales Receipt

NonInvasiveMeds.com™, Inc.®

LISA D. KIEFER
Regional Sales Consultant
2495 NW 39th Street, Boca Raton, FL 33431
Tel: 561-702-5433
E-mail: info@noninvasivemeds.com

0291

DATE 1/30/01

Blvd.

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	MDSE RETD	PAID OUT

QUANTITY	DESCRIPTION	PRICE	AMOUNT
1	1 box of high performance		79 50
2	Lot # 107300		
3	(10 per box)		
4			
5	tax		5 97
6	total		105 47
7	Pd. CK # 7533		
8			
9			
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20			

RECEIVED BY:

Adams 6805

KEEP THIS SLIP FOR REFERENCE

Exhibit P

Simplex Medical Systems
Shareholders Meeting Agenda

430 Ansin Blvd., Suite G, Hallandale, FL 33009
Phone (954) 455-0110 Fax (954) 455-9008

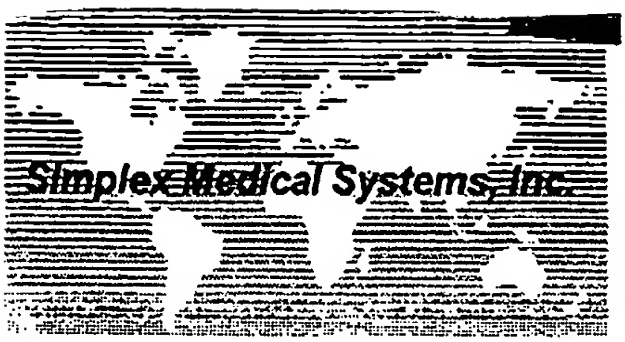
SIMPLEX MEDICAL SYSTEMS, INC.
SHAREHOLDERS MEETING
SEPTEMBER 25, 1996

AGENDA

Welcome	Jack Trafton, PhD President
Financial Update	Joel Marcus, CPA
Marketing Update	Henry Schur VP, Marketing
Technical Update	Nick Levandoski, PhD VP, R & D
Becoming a Publicly-Traded Company	Roger Taft Joel Marcus, CPA
Introduction of Prospective Board Members	Nick Levandoski, PhD Sheldon Nassberg, MD Henry Schur Jack Trafton, PhD
Discussion of Issues Before Shareholders	Jack Trafton, PhD
Balloting	
Election Results	
Adjournment	

Exhibit Q

Simplex Medical Systems Press Release



430 Ansin Blvd., Suite G, Hallandale, FL 33009
Phone (954) 455-0110 Fax (954) 455-9008

PRESS RELEASE

Hallandale, FL - Simplex Medical Systems is pleased to announce that the firm of Oltman Flynn & Kubler has been named as the new patent counsel for the Company. All correspondence pertaining to patent inquires should be directed to Mr. John H. Oltman of the firm at 415 Galleria Professional Building, 915 Middle River Drive, Fort Lauderdale, FL 33304-3585, phone (954) 563-4814.

The firm of Faro & Associates and Mr. John Faro are no longer associated with Simplex Medical Systems, Inc. or Analyte Diagnostics, Inc.

For additional information please contact the company president:
Jack Trafton, Ph.D. at the corporate offices in Hallandale, Florida .

For Immediate Release

13 August 1996